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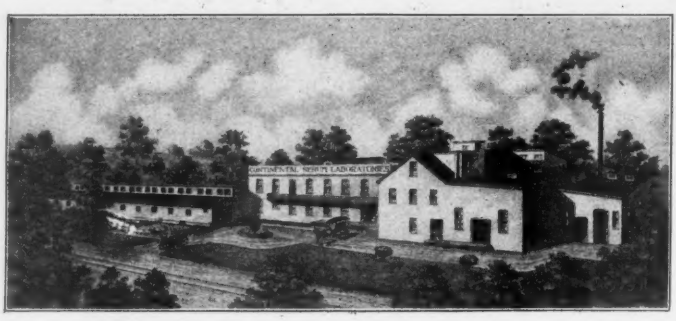

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Cryptorchidism Considered Anatomically

By J. V. LACROIX, D. V. S.; S. L. STEWART, D. V. S.;
R. F. BOURNE, B. Sc., D. V. S.

SINCE the introduction of Miles' technic for the castration of cryptorchid horses, there have appeared many discussions of some phase of cryptorchidism and cryptorchid castration, and these discussions have been, practically without exception, interesting. Nevertheless such discussions appearing, without somewhat lifelike illustrations of the parts described, have not conveyed to the average reader a definite knowledge of the anatomy of the parts that are concerned in cryptorchidism.

Despite the fact that very little is to be learned concerning technic by observing a surgeon castrate a cryptorchid horse, no operation that is performed at veterinary clinics attracts greater interest than this. And it should be so, for if the truth were known generally, there would be a frank admission of the fact that more failures, more discouragement and more fatal or unsatisfactory issues result from cryptorchid castration and attempts at cryptorchid castration than from any other operation that is attempted by general practitioners.

It is not the purpose of this article to give a complete discussion of cryptorchidism but to call attention to some of the anatomical features by means of the plates that appear herewith, and it is hoped that these illustrations will serve to give to the student of veterinary medicine a more definite conception of the anatomy of the pelvic region in equine cryptorchids to the end that he may be materially aided in his first attempt at cryptorchid castration.

To become really proficient in cryptorchid castration, one must acquire a thorough knowledge of the anatomy of the parts involved, as well as a definite idea of the probable manner of descent of the testicle. Anatomical descriptions and illustrations of the pelvic region serve their greatest measure of helpfulness when regional dissection can be made of male colts that have been delivered prematurely. In addition to this, dissections of the pelvic region of normal geldings or entire males should be made, when such opportunities are offered in the course of losses from disease that are experienced by every veterinarian who is doing general practice.

For a consideration of the subject from the surgical standpoint, the reader is referred to the senior author's contribution in Volume X, No. 7, of the AMERICAN JOURNAL OF VETERINARY MEDICINE. A brief embryological study of the genitourinary system is essential for a comprehensive discussion of cryptorchidism.

Investigators pretty generally agree that the sex of a new being is determined at the time of fertilization, but the indifferent development of the various sex organs during the first few weeks of embryonic life affords no discoverable key to the later sexual differentiation. This is the indifferent stage in the development of the reproductive organs.

The early history of these organs is intimately associated with that of the urinary organs; hence, we should inquire into the relations which exist between them during embryonic life and which are more or less in evidence in adult life, especially in the lower vertebrates.

In embryonic origin the future testes or ovaries are first recognized as two cellular ridges appearing on the medial borders of

the wolffian bodies (mesonephroi). The wolffian bodies are a pair of highly developed excretory glands lying in the dorso-lateral portion of the body cavity, later being confined to the abdominal portion as this becomes separated by the developing diaphragm from the thoracic cavity. They are drained by duct systems leading by way of the two wolffian ducts into the cloaca, and later into the urogenital sinus. In fishes and amphibians these glands persist and their ducts become the common conveyors of sperm and urinary secretion. In higher vertebrates, however, they are supplanted by true kidneys (metanephroi) and only the duct systems of the wolffian bodies remain. In females even these are found only as vestiges, but in males they form the excretory duct systems of the testes.

The genital ridges previously referred to, rapidly develop into indifferent sex glands, later specialization providing either the tubular structure of the testes or the follicular structure of the ovaries. These glands, together with the wolffian bodies from which they spring, are suspended from the roof of the abdominal cavity by peritoneal folds, in the anterior portion of which are to be found the blood vessels and nerves supplying them. With the disappearance of the wolffian bodies, coincident with the growth of the true kidneys, these peritoneal folds become the supports for the genital glands and are known according to the sex of the animal as mesovaria or mesorchia.

Lying also within these peritoneal folds and extending backward to the ingunal region, is a fibro-muscular structure which in females becomes the round ligament of the ovary while in males it is known as the gubernaculum testis because of the supposed guiding influence it exerts on the testicle during its migration. The anterior end of this band attaches to the tail of the epididymis, which, it will be recalled, represents the persistent duct system of the wolffian body, now directly continuous with the tubules of the testis. The wolffian duct itself has now become the ductus deferens, and occupies a special lateral fold of the peritoneum, the deferential fold.

With the rapid growth of the fetus and the relatively slower growth of the gubernaculum, the effect is that of a progressive shortening of this ligament, although it is actually elongating. By this means, it is thought that the testicle and its accessory structures are gradually moved backward and downward into the inguinal region where they normally enter the inguinal canal.

Developmental errors are to be found, however, in practically all organs, and since in the system under discussion, profound changes necessarily occur in the evolution of a typical male or typical female equipment out of exactly the same embryonic rudiments, it is but natural that faults in development should be commonly encountered here.

Abdominal retention of the ovaries is the rule, and in all vertebrates except mammals and even in many mammals, the testicles are either abdominal in position or are found in the scrotum only during the rutting season. From the evolutionary point of view, therefore, we may reasonably account for such developmental errors as cryptorchidism.

For practical purposes, cryptorchidism may be considered as abdominal, inguinal and interstitial. In the equine subject, the first two varieties are commonly met. However, cases of interstitial cryptorchidism in horses are occasionally observed. S. L. Stewart reports an unusual type wherein a testicle in a dissecting subject had remained in its embryonal site, posterior to the kidney.

In abdominal cryptorchidism, the position of the testicle is analogus to that of the ovary so far as it is located within the abdominal cavity and suspended by the mesentery. Such testicles are supported by their mesorchial coverings and further attached by means of the gubernaculum testes—a fibro-muscular structure attached to the subperitoneal fascia at a point external to the lateral angle of the internal inguinal ring.

Additional attachment is supplied the floating testicle by means of the vas deferens, which is continued from the testicle within its peritoneal coverings through the plica ductus deferens and the plica urogenitalis to the region of the neck of the bladder. Testicles in this variety of cryptorchidism are usually non-spermatogenic. Occasionally these retained testes become dense, degenerated masses that assume large proportions. In more instances such testes become cystic and sometimes adhesion of these anomalous testes, to the parietal peritoneum, occurs. Frequently the testis and epididymis are loosely joined by that portion of the gubernaculum which normally becomes the ligament of the epididymis so that they are from four to ten inches apart. The blood supply to testicles that are retained in the abdominal cavity is usually sub-normal.

The typical inguinal form of cryptorchidism is characterized by a partial development of the processus vaginalis within which is contained the testicle and its appendages. However, in these cases, the testicle is not located in the scrotum and, in some instances, is so small and situated so near the upper portion of the inguinal canal that it is difficult and sometimes impossible of recognition even by palpation. In atypical cases the epididymis is located in the inguinal canal and the testicle remains in the abdominal cavity. In such in-

PLATE I

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Cross Section of the Pelvic and Extreme Posterior Portion of the Peritoneal Cavity of a Cryptorchid Horse. Structures Shown have been Embalmed in Situ.

1. Testicle. 2. Tail of epididymis. 3. Fat tissue at posterior end of testicle. 4. Gubernaculum testis. 5. Mesorchium. 6. Urinary bladder. 7. Rectum. 8. Small colon. 9. Mesorectum. 10. Vaginal ring. 11. Plica ductus deferens. 12. Plica ductus vasculosa. 13. Internal spermatic artery and vein. 14. Aorta. 15. Vena cava.

PLATE II

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Front-side View of the Pelvic and Extreme Posterior Portion of the Peritoneal Cavity of a Cryptorchid Horse. Structures Shown have been Embalmed in Situ.

1. Testicle. 2. Tail of epididymis (body and head not in view). 3. Fat tissue at posterior end of testicle. 4. Gubernaculum testis. 5. Mesorchium. 6. Small colon. 7. Mesorectum. 8. Site of dorsal part of inguinal canal with peritoneum and subperitoneal basin. 9. Inguinal (Poupart's) ligament. 10. Internal oblique muscle. 11. Small, undeveloped external cremaster muscle. 12. Internal spermatic artery and vein. 13. Aorta. 14. Vena cava.

stances the margins of the vaginal ring become firmly organized so that the testicle cannot be drawn through this opening by means of traction upon the epididymis or the gubernaculum.

In the true abdominal cryptorchid there is necessarily a complete absence of all evidence of scrotum. The structures at this point many times assume the appearance of an inverted funnel, and horses manifesting this condition are known by castrators as "blanks." Since no testicle has descended into the canal, the pudic vessels and nerves are closely invested by areolar tissue as in normal horses, and the entire inguinal canal is filled with a loosely arranged areolar tissue.

At the site of the inner abdominal ring, we should consider the anatomy of these animals under two general classifications—the one wherein there exists a definite area of delicate aponeurotic tissue (the subperitoneal fascia) bounded anteriorly by the margin of the transverse abdominis muscle, and, the other class of subjects, those wherein at the site of the inner ring there is to be found a broad expanse of very thin aponeurotic tissue (the subperitoneal fascia), with no definite heavy surrounding margin or attachment.

"Sperm Formation in the Domestic Animals with Consideration of the Sterility and Fertility in Mules"

WILLIAM M. GOLDSMITH, Indiana University.

I. INTRODUCTION—Stimulated by the appearance of Wodsedalek's paper (January 1916 Biol. Bull.) on the spermatogenesis of the horse, I conceived the idea of making a similar study of the germ cells of the common mule, with a view of ascertaining the cause of sterility in this valuable beast of burden. The first great difficulty which confronts the cytologist in undertaking such a laborious problem, is in obtaining the desired material. In the spring of 1915 this matter was taken up with the president of the Ohio Valley Veterinary Medical Association, Dr. Walker France, who considered the problem of sufficient importance to justify him in rendering assistance. More than a week was spent in "Fording" over the hills of Pike and Gibson counties with the doctor in one of his mad wholesale slaughters of the future progeny of horse colts and the useless passion of as many mules. To the amusement of the farmers, the testes were greedily snatched from the doctor's knife, cut into small bits and placed in Fleming, Bouin, alcohol, acetic and picroacetic fixations, which are extensively used by the cytologist.

At that time I was working on the plasmosome or achromatic nucleolus, of one of the true bugs, and was not in position to turn my personal attention to the newly collected material, until the plasmosome paper was in the hands of the publishers. In the meantime, Mrs. Goldsmith, while working at the Indiana University Biological Station, prepared and studied a vast amount of this material. After three months' work, it was found that all animals, both horse and mule, from which the material had been taken, were too young, as none of them contained mature cells. This material was then stored for future use and arrangements made with Dr. France and other veterinarians, to assist in the collection of material from older animals. However, in January 1916 all plans were abandoned when a paper on "The cause of Sterility in the Mule" by J. E. Wodsedalek, of Idaho University, made its appearance in the *Biological Bulletin*. Since our observations on the earlier germ cells of both the horse and mule agreed with those of Wodsedalek, and further since the problem was given up in recognition of his valuable work, the speaker wishes to present this paper only as a brief treatise on some of the old and new phases of this subject, and not as a cytological contribution. It should be recognized, however, that many months' time has been spent on the problem and much first hand knowledge obtained.

In presenting a paper such as this, it seems wise to sacrifice technical details for a general and more comprehensive discussion. I desire, then, to briefly discuss the *general* methods of sperm formation and to refer the cases of various domestic animals to this general type. It is quite a long and complicated process to follow the history of a cell or group of cells from a non-differentiated germ layer of a tiny embryo, to a mature sperm of the adult, indeed, much more taxing than to listen to even a non-technical paper on the subject.

II. DIFFERENTIATION OF THE GERM CELLS—The maxim of Virchow 1855 "omnis cellula

Read before the Ohio Valley Veterinary Medical Association, Terre Haute, Indiana, Feb. 13, 1917.

e-cellula" (all cells come from cells), after being tested from all angles for more than three score years by the world's most painstaking investigators, has come to be universally accepted. Since, according to this theory all the cells of the body must have originated from a single cell, and further since this single cell can be traced back to the ovaries and testes of the parents, it is obvious that there are two types of cells. These are referred to as somatic and germ cells. The former, which constitute the body tissue, live through a life cycle and then die, while the latter have an immortal life. According to this conception the individual is composed of millions of sub-branches from one single off-shoot of the germ cell. This might be illustrated by a vine which sends up annual shoots. The plants themselves die, but underneath the surface the roots continue to send up new sprouts each year. The branches of the vines, which spring up and then die, correspond with the somatic cells of each individual, while the underground roots are homologous with the never dying germ cells of the ovaries and testes. Thus each individual germ cell constitutes only a small link in the chain of life flowing from the ovaries of Eve to the final destruction of the human race. It is interesting to note that from the standpoint of somatic cells, the father is older than the son, while if the continuity of the germ cells be considered, the son is one generation older than his father.

III. A Typical Animal Cell (Fig. 1.)—The germ cells are usually much larger than the somatic cells and are thus used as a basis for general study. All cells are made up of a nucleus enveloped by a more or less viscous substance, the cytoplasm. The substance inside of the nucleus is spoken of as nucleoplasm or karyoplasm. In the nucleus there is usually found a heavy network (chromatin network) and a dense mass of chromatin, the chromatin-nucleolus. There may also be found a finer network of achromatic substance, (linin-network) and sometimes a spherical mass, the plasmosome, of the same material (Goldsmith '16). The nucleus together with the cytoplasm constitutes the protoplasm.

IV. The Method of Cell Division—After the cell has reached a certain stage of growth, the chromatin-network begins to condense at various points in the nucleus—usually near or in contact with the nuclear membrane (Fig. 5). These aggregations become more and more definite and individualized until they each assume a compact and characteristic form, (prophase stage, Fig. 6.) These newly formed bodies are called chromosomes and are uniformly characteristic of the species in which they are found. They vary from two in a thread worm to 1,600 in a ceratin radiolaria. A small body (the centrosome, (Fig. 7) from which radiates cytoplasmic lines (astral rays Fig. 7), now appears on either side of the nucleus. The nuclear wall is then destroyed as prominent fibers (spindle fibers Fig. 7) connect these two points as centers and force the chromosomes into a median position, thus presenting a typical spindle (metaphase condition Figs. 19 and 7). The chromosomes now divide lengthwise and one-half of each passes to opposite poles of the spindle. While the chromosomes are on their way to the poles (anaphase stage Fig. 8) the entire cell begins to divide. This continues until after the chromosomes have reached the spindle (telophase Fig. 9), when the two daughter cells are completely separated. The chromosomes of each daughter cell now reassume their early woolly appearance and gradually pass into the network condition, while the nuclear membrane and the other parts of the cell are being reconstructed in preparation for the next divisions.

V. The "Green" Germ Cells—(spermatogonia). The processes in cell division are essentially the same whether somatic or germinal. However, since the former cells are smaller, the component parts are more compact and not so readily differentiated. From a very early embryonic condition until near the time the animal is capable of reproduction, the large cells which were set aside for this purpose, gradually increase in number by the above method of cell division. (See plate "Green Germ Cells.")

When the animal is near maturity (soon to be capable of reproducing), a number of these cells seem to lose their division energy. They then enter a quiescent or rather a ripening stage in preparation for the great function for which they were ordained, namely, that of reproduction. We who live "microscopic lives" speak of this stage as the *growth*, or *maturation* period of the germ cell. The speaker has one form under investigation in which he is able to predict by the appearance of the cells those which have about lost their division energy and are ready to undergo maturation.

VI. The Ripening of the Germ Cells—*(The maturation period).* A. *The growth stage.* After an early germ cell has lost its division energy and is ready for ripening, the two daughter cells resulting from the last division fail to reconstruct as usual to form another division spindle. The nuclear wall is usually reformed but the nucleus itself is filled with a dense fibrillar but somewhat granular network (Fig. 2). Among this homogeneous network there is usually (indeed, always in the domestic animals) found one or more compact bodies resembling the chromosomes

(Fig. 2 to 11). In fact, we have demonstrated conclusively that these bodies have persisted as distinct individuals from the chromosomes of the earlier divisions, all others having been spun out to make this new network. These dense bodies never break up as do the other chromosomes, but continue as independent elements while the cell is ripening. They are called the "sex-chromosomes" or better "female producing chromosomes" since they are, at least, associated with sex-production.

As the cell and nucleus continue to grow, some very interesting changes take place in the fibrillar network. Typically it forms into as many long strands as there were chromosomes in the earlier stages not considering the sex-chromosomes (Fig. 3). The ends of these dense threads are now mysteriously drawn to one region, usually against the wall of the nucleus. Since they seem to be floating in a nuclear sap the median parts of each thread swing out into the nucleus, forming a bundle of very clear loops (Fig. 4). The cytologist calls this the bouquet stage of the ripening cell. The female producing chromosome is usually in the thickest part of this bundle. As these loops decrease in size, presenting a very compact condition (synizesis) they are ofttimes observed to pair (synapsis). Since each loop represents a chromosome, the number of these bodies is now evidently reduced one-half, excluding the mysterious sex-chromosome. This reduction in number is very significant, since it is necessary in order to keep the number constant for each species of animal. It will readily be seen now that when a father cell and a mother cell, each with *half the normal number of chromosomes,* unite, that the daughter cell will possess the normal number of the parents—the daughter the number of the mother and the son that of the father. Should this fortunate process not happen, and the mother and father pass to the child their normal number instead of one-half, our cells would soon be bursting with chromosomes and thus future production would be impossible.

The compact mass of chromatic fibers now break up and are again faintly distributed through the nucleus (Fig. 5). As the cell still continues to grow, this faint chromatin material collects into as many aggregations as there were pairs of fibers (Fig. 6). These masses now condense and form the chromosomes for the first of the two ripening divisions (Figs. 7, 8 and 9.)

B. *The two ripening divisions.* The germ cells now undergo two divisions, differing somewhat from those discussed earlier. The number of chromosomes in these divisions is one half, plus, the sex-chromosomes which had no mate in the growth period. This female producing body still (in most forms and in all domestic animals) refuses to associate with the other chromosomes but takes its position at one side of the spindle, but in advance of its neighbors (Figs. 7 and 8). All the common chromosomes divide as usual and the respective halves pass into the daughter cells. Since the sex-chromosome passes undivided to one cell we have two different types of cells produced. It will be noted later that the one with the extra body (Figs. 8, 10 and 11) will produce a female while the one without this important chromosome (Figs. 9, etc.) will give a male. In some forms (not in domestic animals) the sex-chromosome divides in the first but passes bodily to the daughter cell in the second division, the resulting process being the same.

These two types of cells now divide once more, all chromosomes taking part in the process, and then pass into another state of reconstruction. These reconstructing cells are now called "spermatids" (Fig. 10) and are transformed directly into sperms (Fig. 11). This process of transformation is very complicated and has been worked out to the most minute details. The most important point to consider here is the fact that all the chromosomes, except the female-producers, again pass into the fibrillar condition. In some forms the sex-chromosomes can be followed step by step into the head of the mature spermatozoön.

VII. A Typical Ripe Male Germ Cell. A mature spermatozoön (Fig. 11) consists of a head, neck or middle piece, and a tail. At the forward point of the head there is a small sharp body, the *acrosome,* by means of which the sperm bores its way into the egg (ovum Fig. 12). The chromatin material is located in the more or less elongated head. The tail which is surrounded by a thin membrane (tail envelope) is an organ of locomotion and is usually broken off as the sperm enters the egg (Fig. 12), its function having been completed.

VIII. The Ripening of the Female Germ Cell. The development of the female cell differs only in minor details from that of the male. In ripening, however, each division produces daughter cells extremely different in size. The larger ones (Figs. 18 and 16) continue to mature and prepare for fertilization, while the smaller (the polar bodies, Fig. 17) die and are absorbed. It is readily seen from the plate that, from the same number of green-cells, four times as many sperms are produced as there are eggs. This is very fortunate as the sperms must undergo much more hazardous experiences in reaching their desired destination, and thus more liable to destruction than the eggs.

IX. Union of the Sperm and the Egg. After the sperm enters the egg (Figs. 12 to 15), the middle piece, which carries "the ac-

tive center of cell division," *the centrosome*, turns in the direction of the egg nucleus (Fig. 12) and a joint spindle between the male and female cells is formed (Figs. 13, 14 and 15). The most important consideration in this process is the fact that *the reduced number of chromosomes brought in by each parent cell now unite to form the normal number for the offspring* (Fig. 15). Furthermore, *the chromosomes from each parent are equally distributed in every daughter cell* (study Figs. 13, 14 and 15).

X. Sperm Formation in the Domestic Animals. All the essential steps in the formation of the sperms in the common domestic animals, conform in general to the foregoing consideration. It thus becomes necessary to refer only to the variations and especially interesting points in the germ cellls of these animals.

A. *Birds.* The cells of the birds are very small, and the constituent parts are so crowded and irregular in shape, that a study of these forms is very laborious. Guyer, for example, has only recently (Oct., 1916) published the results of over ten years' study on the sperm formation in the common rooster. Here he finds, in addition to the mass of irregular chromosomes, a larged curved sex-chromosome, which stands aloof from its neighbors while on the first maturation spindle. "A similarly constant element, differing in form from the common fowl is found in the guinea and in the guinea chicken hybrid." Since the early germ cells of the chicken have sixteen ordinary chromosomes plus this sex-element, and since this element neither conjugates in the ripening process nor divides in the first ripening division, one daughter cell has eight ordinary chromosomes, while the other possesses, in addition to these, the large curved sex-element. The ordinary chromosomes of each daughter cell now pair and fuse, leaving four in one and four plus the sex determiner in the other. All chromosomes again divide in the second division, and thus it is brought about that two classes of cells are formed containing 4 and 5 chromosomes respectively.

In the hybrid pheasants and hybrid guinea-chickens the normal development continues up to synapsis when the chromatin fibers are unable to unravel from the synaptic knot (see Figs. 4 and 5). The mass of chromatin remains attached to the nuclear wall and then either disintegrates, or abnormal spermatozoa are formed which are incapable of fertilization. This clearly accounts for the fact that the breeding of hybrid birds of various kinds is an impossibility.

B. *Mammals.* One of the first mammals to be studied was man. Although perhaps not classed as a domestic animal, the "close relationship" would warrant a brief reference. Man represents one of the most problematical cases of cell study. The number of somatic chromosomes has been variously counted from 24 to 38 (Fleming 24, Farner, Moore, Walker 32, Wieman 33 to 38), while the number in the testes are given as 47 by Winiwarter and 22 by Guyer and Montgomery. The first worker obtained his data from a white man,

Explanation of Plate

The small active cells at the top of the plate are known as spermatogonial (in the male) and oögonial (in the female) cells. They represent a few of the many divisions which must take place before a single germ cell of a tiny embryo can become the large reproducing testis or ovary of the adult animal.

Figures 2 to 6 inclusive and the corresponding figures to the right show some of the more important steps in the growth periods of the ripening germ cells.

At the stages shown in Figures 4 and 5, the germ cells of the mule and other hybrids first begin to show indications of abnormality which results in the final destruction of the cell.

Fig. 7. First ripening division of the male germ cell. (First spermatocyte division.)

Fig. 19. Corresponding division in the ovary. (First oocyte division.)

Figs. 8 and 9. Second ripening division. (Second spermatocyte division.)

Fig. 18. Second oocyte.

Fig. 10. Spermatids (first two with and the second two without the sex-chromosome).

Fig. 11. Mature spermatozoa.

Fig. 16. The single large mature egg.

Fig. 17. The three small eggs (the polar bodies) which never mature.

Figs. 12, 13, 14, 15, represent the possibility of the single egg (Fig. 16) being fertilized by any one of the four "brother" spermatozoa shown in Fig. 11. Since the first two contain the sex-chromosome, a union of either of these with the egg would result in female offspring (Figs. 12 and 13), while the other two would produce males (Figs. 14 and 15).

Figs. 12, 13, 14 and 15 also show that "the reduced number of chromosomes brought in by each parent cell (Figs. 12 and 13) unite to form the normal number for the offspring (Fig. 15)," and that "the chromosomes from each parent (Fig. 13) are equally distributed in every offspring (Fig. 15)."

Fig. 1. A typical animal cell.

♂=Male.

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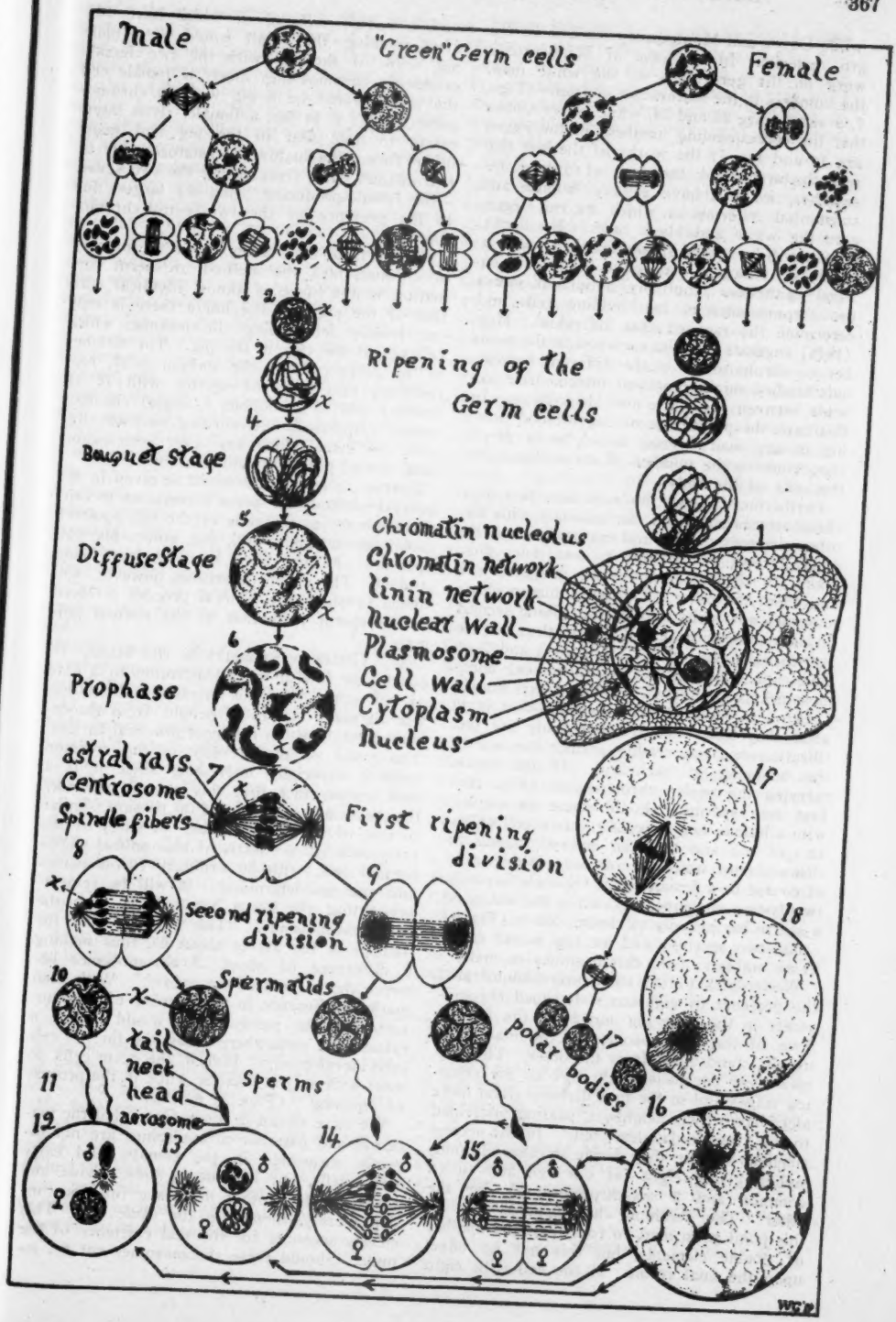
Male
"Green" Germ cells
Female
Ripening of the Germ cells
Bouquet stage
Diffuse stage
Prophase
Chromatin nucleolus
Chromatin network
linin network
Nuclear wall
Plasmosome
Cell wall
Cytoplasm
Nucleus
astral rays
Centrosome
Spindle fibers
First ripening division
Second ripening division
Spermatids
tail
neck
head
acrosome
Sperms
polar bodies
1
2
3
4
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6
7
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19

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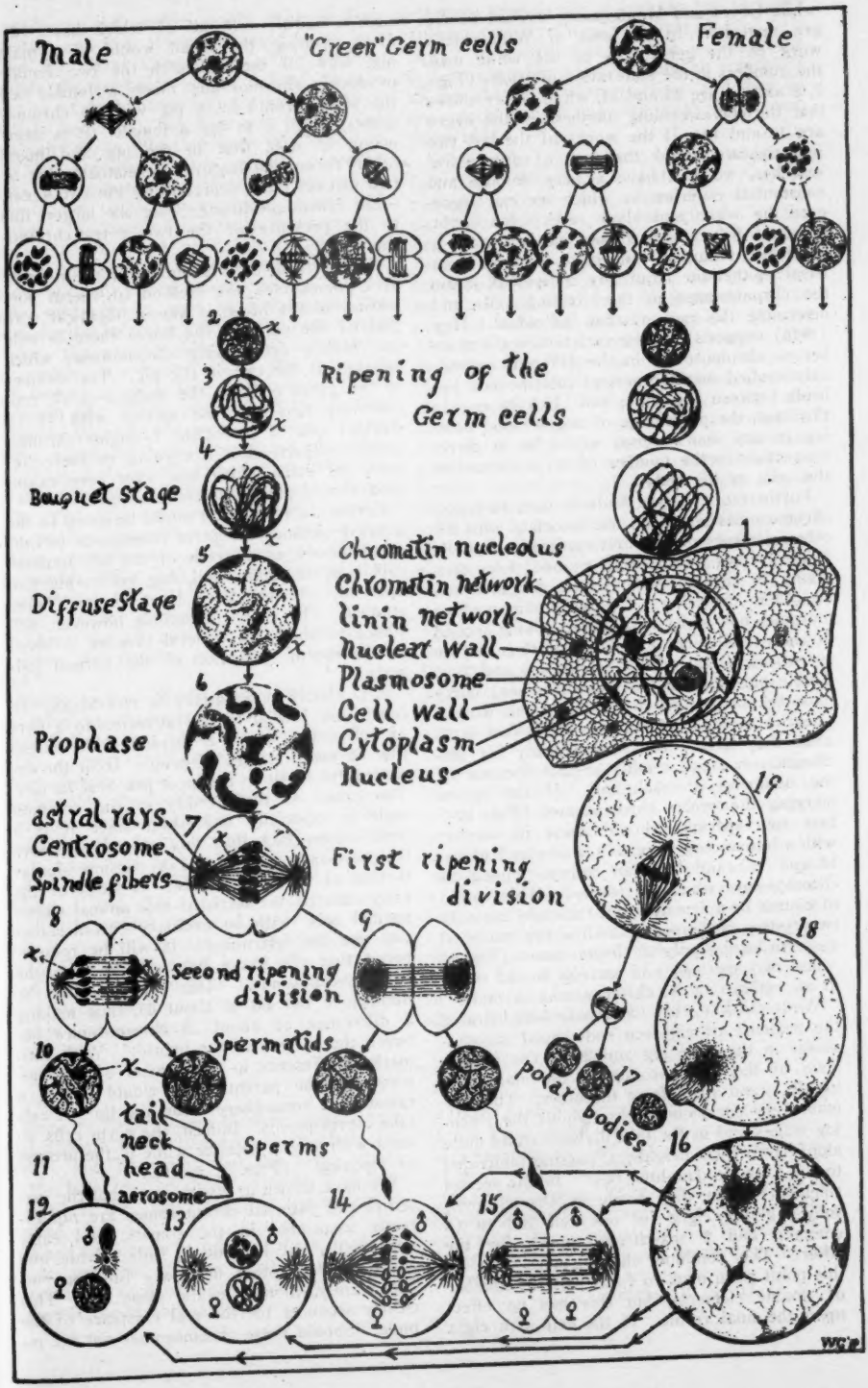
Male
"Green" Germ cells
Female
Ripening of the Germ cells
Bouquet stage
Diffuse stage
Prophase
astral rays
Centrosome
Spindle fibers
Chromatin nucleolus
Chromatin network
linin network
Nuclear wall
Plasmosome
Cell wall
Cytoplasm
Nucleus
First ripening division
Second ripening division
Spermatids
Sperms
tail
neck
head
acrosome
polar bodies
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while Guyer and Montgomery worked on Negro material. In the case of Winiwarter's work on the germ cells of the white man, the numbers in the maturation divisions (Figs. 7, 8 and 9) are 23 and 24, while Guyer shows that the corresponding numbers in the negro are 10 and 12. If the works of the last two investigators stand the test of future researches, we will have a very definite and substantial criterion by which we can segregate the white and black races. No doubt, it soon will be a very simple matter to take a small bit of muscle, connective tissue or even nasal epithelium from any individual, count the chromosomes in the dividing cells and determine the race of that individual. Hoy (1916) suggests that the variation in the number of chromosomes in the different individuals studied might represent intermediate hybrids between the white and black races. In this case, the percentage of negro blood flowing in any man's veins, would be in direct proportion to the number of chromosomes in the cells of his body.

Furthermore, Guyer finds in man two sex-chromosomes which do not associate with the other elements on the first maturation spindle (Fig. 7) but pass bodily to one pole, thus giving 10 chromosomes in one daughter cell and 12 in the other. The ten common chromosomes now unite two by two, giving second division cells (Figs. 8 and 9) and thus mature sperms (Fig. 11) with 5 (5 double) and 7 (5 double plus the two sex-chromosomes) chromosomes respectively. Assuming the woman (negro) to have 24 chromosomes—that is 12 after they have been reduced ready for fertilization—we can readily predict the sex of the offspring of each cell. If the sperm carrying the twelve chromosomes (Fig. 11—first two sperms) should come in contact with a human egg (Fig. 16), a new cell (Figs. 12 and 13) and later an embryo having 24 chromosomes would be formed. This would of course be a female, since the male has only twenty-two chromosomes, while the union of a sperm having only 10 chromosomes (Fig. 11—last two sperms) and an egg would result in an embryo of 23 chromosomes—a male.

Wodsedalek (1913) has clearly demonstrated the presence of eighteen rod-shaped chromosomes in the male pig and 20 in the female. Two of the chromosomes in the male cells usually stand apart from the other. They remain very conspicuous throughout the ripening stages and in the first division stand quite aloof from their neighbors, passing undivided to the "female daughter cell." In the second ripening division they divide as other chromosomes, giving eight for one cell and 10 (8 common and 2 sex-chromosomes) for the other. The common chromosomes fuse at this point as in man, to form half the number of double elements, but this has no effect upon the final result. If the cell with eight meets a female cell, all of which have 10 after ripening, the result would be a male pig, while if the cell with the two female producing chromosomes meets a female cell the result would be a pig with 20 chromosomes, which is to say, a female. It is interesting to note that in the pig and many other forms the mature spermatozoa are of two distinct sizes, representing the two sexes, —the female-producing being the larger, due to the presence of the two extra chromosomes.

Except from the standpoint of the number of chromosomes, the method of sperm formation in the horse is almost identical with that of the pig. In the horse there is only one female determining chromosome, which behaves as the two in the pig. The number in the green cells of the stallion is 37, representing two types of sperms with 18 (9 double) and 19 (9 double, 1 single) chromosomes, respectively. According to these figures, the mare which has never been examined, should possess 38 chromosomes.

Further consideration might be given to the general methods of sperm formations in other mammals, as the cells of the cat, squirrel, rabbit, white mouse, bull, dog, guinea-pig, rat, opossum and bat have been, or are being studied. The above discussion, however, will suffice to show the general process involved in the sperm formation of the normal animals.

XI. Cause of Sterility of the Mule. In conclusion I wish to call attention to a case of cell study which is attracting the attention of many classes of people, from the secluded cytologist to the most practical farmer. The cause of the sterility in the common mule is especially interesting since it is a well known fact that this animal possesses the necessary organs and a passion similar to that of the horse or ass. A study of the early cells of the testis of this animal shows normal cells with 50 ordinary chromosomes and one sex-determiner. It will be remembered that the horse has only 36 plus the extra chromosome. "This suggests that the number in the ass is about 65, thus making a difference of about 28 chromosomes between the parents of the hybrid." With such marked difference in the number of chromosomes in the parents, one would expect a catastrophe somewhere along the line of cellular development. Indeed, the germ cells do meet with such a disaster while in the process of ripening. (Figs. 4, 5, etc.)

We have shown in other forms that the maternal and paternal chromosomes are not directly associated in the somatic and early germ cells, but lie side by side, divide and carry on their other necessary functions independently, though in the same cell. This clearly accounts for the real existence of the mule. Should these chromosomes not act in-

dependently, the conflict would occur at fertilization and thus the mule would be an impossibility. This independent action further permits the existence of the desired characteristics of both horse and ass in one intermediate individual, but does not explain the possibility of an offspring from this hybrid.

While considering the typical ripening stage, it was noted that there is a pairing of homologous chromosomes from father and mother. "In case of the mule, however, because the ovum and sperm contributed such unequal numbers of chromosomes, there are many without a homologue with which to mate, and even in case of homologues the physiological incompatibility of the two plasms renders the pairing difficult and incomplete, or prevents it entirely." This disturbance is sufficient to cause a destruction of the ripening germ cell. Wodsedalek (1916) insists that, "Most of the cells disintegrate during the prophase, especially during the period of synapsis (Figs. 4, 5 and 6.) Others meet their fate in the metaphase of the early anaphase stage (Fig. 7). *The remaining few that survive the anaphase succumb soon after, and no secondary spermatocytes* (Figs. 8 and 9) *nor spermatids* (Fig. 10) *and consequently no spermatozoa* (Fig. 11) *are formed and the hybrid remains sterile.*

"There are no authentic cases on record showing that fertility ever occurs in this hybrid."

Shortly after Wodsedalek uttered these sweeping conclusions, Lloyd-Jones of Iowa State College cites (Jour. of Heredity., Nov., 1916) a number of cases from literature in which female mules and "hinnies" were unquestionably the mothers of colts. The most authentic case cited was that of a hinny owned by Mr. J. M. Bryant, of Quincy, Ind. This hinny was reported as having been in foal three times. The first two colts were deformed and died, but the last pregnancy resulted in normal twins. Another interesting case is reported by Dr. D. W. Sullivan, of Weed, Cal. This animal is out of a standard bred mare by a mammoth jack. She was put to a black Percheron stallion and produced a male "grade mule."

I have been unable to find any record either authentic or otherwise of a reproducing male mule. It is true that the test is less likely to be made with the male mule, as practically all are castrated when yearlings and they do not reach sexual maturity until about two years old.

When such contradictory cases as those just cited are brought to light, the cytologist can only become more conservative and seek an explanation for the exceptions. In the first place, we could easily assume with Lloyd-Jones that the maturation of germ cells of the female were sufficiently different to permit an occasional complete development of an ova, but never of a spermatozoön. To one who has made a comparative study of the development of the germ cells of the two sexes, this assumption does not seem justifiable, especially in the present case, where the number of chromosomes of the parents differs so greatly. In fact, it seems just as possible for a male mule to reproduce as a female, the chances of course, being greater for the latter to be put to test.

In a study of hybrid pheasants it was found that most maturing cells were destroyed about the time of the first maturation division (Fig. 7). However, some continued their normal development through the second division (Figs. 8 and 9), and still others formed abnormal sperms (Fig. 11, fourth sperm). Since the same condition, though less marked, was found in the hybrid pigeons, and the mule, it seems evident that the point of destruction depends entirely upon chance. This being the situation, it seems quite plausible to assume that in rare instances a chromosomial arrangement might be brought about by which a certain number of maternal and paternal chromosomes are paired, those having no mate either continuing unpaired or being extruded from the cell. Much more light will be thrown upon this subject when material for the study of the germ cells of the ass can be obtained. Regardless of the accuracy of these or any other technical assumptions, we are forced to agree if the above cases are to be accepted, that the production of offspring by the common mule is indeed a reality.

Rugh, in *Pennsylvania Medical Journal*, says that glonoin is the physiological antidote for cocain, and he claims that the toxic effects of the latter can be surely avoided if glonoin is used at the same time that the cocain is applied.

When the cocain is injected three drops of a one per cent glonoin solution should be injected for each half grain of cocain. This dosage is for human subjects.

If the author of the article is correct, and if the same result can be obtained in veterinary subjects, we can well afford to make use of it.

Most of us have had to stop in the middle of an operation on more than one occasion, especially in horse practice, because the patient suddenly developed marked symptoms of cocain poisoning.

M. R. Steffen, V. S., M. D. C.

The Veterinarian's Duties as "Conducting Officer" in Trans-Oceanic Shipment of Horses

By CHARLES B. BANKS, D. V. M., Germantown, Tenn.

I WILL give a detailed account of the duties and requirements of a veterinarian, or "conducting officer," as we are sometimes called by the Remount Commission.

After consultation with the major or captain at the head of the Remount Commission in whatever port one may be in and showing of proper credentials, etc., the following contract is signed in triplicate:

Contract of an American Veterinarian Serving With the British Remount Commission as Veterinarian or Conducting Officers

I, Charles B. Banks, of Germantown, Tennessee, U. S. A., being qualified to practice veterinary medicine and surgery, and being registered as a member of the Harvard Veterinary College, Boston, Mass., hereby offer to serve as a veterinary surgeon to His Majesty's Forces, on the following conditions, either at home or abroad as conducting officer for remount transports.

(1) The period of my service hereunder shall commence from the date of my joining for duty and shall continue until the expiration of twelve calendar months thereafter, or until my services are no longer required, whichever shall first happen.

(2) My pay and allowance shall (subject as hereinafter appears) be the same as received by a lieutenant of the army veterinary corps.

(3) In addition to such pay and allowances, if sent abroad, I shall receive free passage from the United States to that country together with traveling expenses from my residence to the port of embarkation; and (subject as hereinafter appears) a similar free passage from the United Kingdom to the United States, together with traveling expenses from the port of disembarkation to my residence at end of said period.

(4) In the event of my being employed on conducting duty, my pay shall be at the rate of one pound sterling ($5.00 U. S.) per day whilst on board ship in charge of remounts, or ten shillings ($2.50 U. S.) a day only if not in charge of animals (i. e., whilst proceeding to or returning from conducting duty) and a bonus on the following scale in respect of animals landed in good condition, of which the general officer commanding or an officer acting on his behalf shall be sole judge:

2 shillings (48 cts.) a head if the losses do not exceed 1%.

1 shilling and sixpence (36 cts.) a head if the losses do not exceed 2%.

1 shilling (24 cts.) a head if the loss do not exceed 3%.

Nil if the losses *exceed* 3%.

(5) During the said period I will devote my whole time and professional skill to my service hereunder and will obey all orders given me by the commissioned military or naval officers or by permanent veterinary officers.

(6) In case I shall in any manner misconduct myself or shall be (otherwise than through illness or unavoidable accident) unfit in any respect for service hereunder, of which misconduct or unfitness the general or other officer under whom I am immediately serving shall be sole judge, such superior officer shall be at liberty from and immediately after such misconduct or unfitness to discharge me from further service hereunder and thereupon all pay and allowances hereunder will cease.

Dated this 23rd day of November, 1916.

CHAS. B. BANKS.

Witness to the signature of the said Chas. B. Banks, JAMES H. POOL, *Witness.*

Accepted upon behalf of the Army Council.

R. H. MARSHAM, *Major,*
Staff Officer Embarkation,
British Remount Commission,
Newport News, Va., U. S. A.

The first duties generally will be to inspect all grain, hay and feed in general. This is no small job on the New Orleans docks on a hot day. Quantity as well as quality of feed has to be considered with reference to the length of trip, weather conditions, etc., etc. All stalls, troughs, pharmacy outfit, list of medicines and instruments are also inspected.

At the time of loading, mules are to pass inspection in single file from a chute one-quarter of a mile long. Horses are brought before the veterinarian four at a time, and a physical examination is necessary. Membranes are examined, pulse noted, respiration counted, mouth examined, etc. The ship is waiting and the examination must be fast but thorough, because once an animal gets past

and on the ship, it is in the veterinarian's charge and counts against him if not delivered in good condition on the shores of the United Kingdom.

Various forms of influenza, stomatitis, pneumonia, fever, lameness, wounds, stocked legs and general physical mal-condition must be dealt with. These horses and mules have already passed by the British remount veterinary officer at the pens, but I have rejected as many as twenty-one in a shipment of 900 head and as many as eighteen in a shipment of 500. As soon as the last animal is on board, carpenters tear down the loading chutes, board up the entrances, which are used as stalls; goodbyes are said with best wishes, and with a handshake the pilot gives the order to "cast off" and the steamer slowly moves away on her perilous trip across the Atlantic.

Besides the animals, the cargo generally is mixed, always one-third food products or munitions, always weight sufficient to put her deep enough in the water to retard her speed and make it very dangerous in rough weather on account of the open hatches. One is provided with a head foreman, four or more assistant foremen, one horseman to every twenty head, and sometimes a dispenser and two night watchmen. They are generally easy to handle, good natured and jolly but rough, and on shore in the United Kingdom are generally closely watched. Two men from my ships were hanged for murder there and others heavily fined and imprisoned for not observing the "Aliens' Restriction Order" 1914.

The first two or three days out hay only is fed, about 15 pounds with salt and plenty of water. The third day, one part oats is fed with two parts bran morning and night, 7 a. m. and 4:30 p. m.; hay three times daily and salt every other day.

Mucking out must begin at once and continue throughout the voyage. One cannot enter any port without inspection, and if filth has accumulated the ship may be refused entrance into the dock. Disinfection continues throughout the voyage and is very important. Crude creolin and chlorid of lime are used mostly.

The conducting officer must be energetic. There must be unremitting attention to and supervision of watering, feeding, mucking out, etc. In other words, one must look after every man and every animal personally day and night.

Sick animals are removed to the upper decks as far as possible, which is not very easy when the runway is removed to allow the hatches to be put on in case of rough weather. The treatment of hopeless cases is not attempted. It is contrary to hygienic principles and leads to the infection of neighboring animals. Unnecessary drugging is avoided. Preventive hygiene and active individual attention are far more important than drugs on board ship.

Vaccines and serums were not allowed from August, 1915—$150,000 had been spent in their use and the results did not seem to warrant such expenditure. So the remount commission said: I carried a good supply of my own and landed a good many that I am sure never would have survived the ordeal had I resorted to the British form of drenching.

The thermometer is very valuable on shipboard, but many times in using it one needs to be an athlete on account of the forward-backward motion of the animals, the limited space and crowding neighbors, etc.

The successful conducting officer must be a hygienist and disciplinarian rather than a therapeutist, a good horse master rather than a skilled prescriber.

The trip from New Orleans, La., to Avonmouth, England, a port of Bristol on the Avon river, takes twenty-two days from the start to the unloading time. It takes eight days going through the Gulf of Mexico and the straits of Florida. The temperature of the water there was never less than 80° and in parts of the steamer the thermometer registered 107°. The nights were as hot as the days down below. There was no breeze, or else the breeze would follow us, which is worse than none. The steamer being all steel, the sun and the water (86°) keep it from cooling until it passes Bermuda and starts across the Atlantic.

On one trip I had 100 mules with high fever, not eating anything except a litle hay. They had pus in the inferior, anterior chambers of their eyes so they couldn't see the feed trough. There were cases of regular sea sickness, heat exhaustion, fever, collapse, influenza and complications. Every case of septic pneumonia must be destroyed as soon as a definite diagnosis can be made. Any animal landed with the symptoms counts against one's bonus. About this time there may be a strike among the horsemen or a shirking of work, failure to carry out orders, etc., which leads to heroic measures, especially with a negro crew. Ship life and food do not agree with the average American hobo, and he rebels about the second week. When due to the carelessness of some horseman, the veterinarian in charge sees a mule going over the side, costing him from $50 to $100, according to the per cent it makes, it causes him to sit up and take notice.

As we approach the danger zone (500 miles from the Irish coast), all lights are ordered out, below as well as on deck, and then the trouble begins. If a struggling horse is down in narrow quarters, kicking and bruising him-

self and the others tearing down fixtures, a heavy swell renders it unsafe for any one to get very close to the mix-up. One must work almost in the dark, except for a dim flashlight.

In the day time everybody is peering out over the waters looking for periscopes or the wake of a torpedo, and it is some job to keep men below attending to the animals. Wireless messages come and go in code and news of all kinds is circulating on the decks. Finally we meet our first patrol boat and many flags send wordless messages from the protector to the protected. The patrol accompanies us for a distance and finally turns to convoy another ship from about the same point she found us. We soon approach another patrol ship. This time it is a naval vessel, fast and grim looking. More signals, and then she in turn leaves us and we go—no one but the officers know where. These ships go in places at night with no lights, where in times of peace if a captain attempted to sail there in the day time, he would lose his position.

We are now about in sight of some part of the Irish coast or of Wales or of England (Scilly Isles), but only officers are allowed to look at the chart. Suspense is at pressure now, and we are about to cross the German submarine patrol line, which is a four-sided area, no two sides parallel—a line running from the south coast of Ireland across to the Scilly Islands, thence to the south coast of Wales, thence to the east cost of Ireland and joining the point of beginning. Generally two submarines patrol each line and no ship of the transport variety can cross two lines at night. If one crosses at night, the next must cross in the day time. One hardly knows when danger is past until finally well up the Bristol channel, when the lights of Barry are seen and the police boat stops us in "Barry Roades" and amid powerful searchlights we are cross-examined to their satisfaction and perhaps a pilot comes aboard and we proceed up the Avon River to anchor. The tide is very swift here, with a rise and fall of twenty-eight feet, and only at high tide can a ship enter dock to unload.

A signal station on the right or English bank, notifies us to go up to dock. A couple of tugs meet us, and we are towed into Elizabeth dock with a sigh of relief. After being docked all kinds of officers come aboard. No one is allowed on shore without a permit. Armed guards patrol the sides and gang planks. Time is set for unloading the horses. The lieutenant or captain of the veterinary department of the remount station is escorted about over the ship. The veterinarian in charge is supposed to locate all weak and sick animals for him and describe their condition, etc., as a great many have to go to the hospital before entering the remount station. This veterinary captain in turn reports to his commander on the general condition of the lot and upon his report depends the amount of one's *bonus*. He may take a hundred or two away in a word and one has no redress. I know of cases where all bonuses were wiped out at this stage of the game. However, I was fortunate in always landing without penalty, and on my last trip, not only delivered all horses entrusted to me, but had a receipt reading "In very satisfactory condition," which I was told is not given often. Only ten head went to the hospital, and for trivial causes.

As soon as I get my receipt for the animals from the officer in command of the remount station and he also gives me my order for transportation to London, I find the aliens officer on board. He issues me a permit after looking at my United States passport, photo, etc., to land. The captain of my steamer gives me a "military pass" to go through the dock gates as this is prohibited naval area, and I present my order for a first class ticket to London as military officer traveling on duty.

If one stops over in Bristol, a city of 250,000 people, he must go at once to the police station, show all his papers, have his passport stamped, place his thumb mark on record (first time in country only), tell where he will stay that night, when he will leave, where he will go, and all this has to be gone through with every time he travels. Upon arrival at London he finds his way from Paddington station to the "War Office," 16 Victoria street. He reports to the sergeant there who looks him up in the "big book," takes his papers that he received from the officer after unloading the horses. The pay paper is then made out, which the sergeant takes to Major Rainey, who in turn issues a receipt for the papers and an order on the Eastern Command Paymaster for the *bonus only* earned during the passage. After drawing the bonus, the veterinarian is at liberty to go as he wishes, but must keep track of his steamer and be posted at what port she is and on what date she will sail. After unloading the animals, the steamer carries her cargo to Liverpool, Glasgow or some other port, and the veterinarian must be there when she sails.

Wherever one stops in city or town, he must register with the police and also fill out slips to correspond at the hotel stopped at. They keep track of every alien and traveler in the United Kingdom.

Coming back the ship is cleaned, washed, stalls repaired, whitewashed, and must be clean and sweet when she enters port for inspection prior to loading more animals. Upon arrival the veterinarian at once reports to the officer in command of the remount commission, who signs the pay order for salary on

ship and on shore. While in the United Kingdom the veterinarian gets ten shillings ($2.50 U. S.) and fifteen shillings ($3.75) for expenses. In America on shore, he gets ten shillings or $2.50 a day and twenty shillings or $5.00 for expenses. This is paid by the remount commission prior to the day of sailing on the next trip.

Regular Fees

By M. R. STEFFEN, V. S., M. D. C., Potter, Wis.

THERE are a number of veterinary practice procedures which occur in regular form under all conditions and for the delivery of which a standard, and somewhat uniform fee, has been established among the practicing veterinarians.

Most of these fees are slightly higher in the South and in the West than they are in the East and North. Among these charges of a somewhat uniform nature the following are most noteworthy:

1. Fee for dentistry.
2. Fee for castration.
3. Fee for city calls.

Dentistry Fees

The charge for ordinary dental work, what is commonly called floating, varies from a fee of $1 in the middle West, to a fee of $3 in the Southwest.

It goes without saying that the former is too low, and the latter is, at least under some conditions, too high.

There should be a uniform charge for this work throughout the country and a medium could be struck for a satisfactory charge between the two extremes named, at least, there should be no extremes such as these. It is true that in the West and the Southwest the practitioner is frequently called upon to float the teeth of only party gentle western horses, and of obstreperous mules. In consideration of this fact he should be permitted to make a higher charge for this dental operation than the practitioner of the middle West and East, whose patients are more docile and tractable. Having regard for the conservation of his own assets he should not, however, make the fee so high that his patrons will thereby be deterred from engaging his services.

It is an indisputable fact that the infringement on this branch of the practice of veterinary science by horseshoers and others, is in a great part the result of an unreasonable charge for the work on the part of the veterinarian. This is true when either extreme of charging exists.

In the East and middle West the average veterinary practitioner has been in the habit of charging so little for this work that he has been in this way instrumental in belittling the value of the work among his clients. Because he could charge no more than $1 he has not done the work in all cases as thoroughly as it should have been done. This has had the effect of creating in the minds of the laity the presumption that any one could float the teeth of a horse. The individual with a natural preference for such service among the laity is then, usually, the horseshoer.

In the case of an extremely high charge, such as the $3 fee, for ordinary floating the same effect is produced. The veterinarian's patrons either do not allow their horses' teeth to be floated, or they entrust the operation to the horseshoer who charges a few cents for "filing" off the teeth. A charge of $3 is without question too high. The charge for floating horse's teeth, when the horse is not extraordinarily resistant, is placed with reason at $2. A charge higher than this can only have the effect of "scaring away trade," while a lesser charge has the effect of detracting from the merits of the operation.

Should an individual subject prove especially vicious and troublesome an additional charge of $1 is not unreasonable.

In rare instances it occurs that, because of the vicious temperament of an individual horse, the item of restraint is of greater importance than the item of professional service. Some such horses are presented to veterinarian after veterinarian, and the attempt to satisfactorily float the teeth is often abandoned.

When an animal of this sort is presented, and the practitioner succeeds by special methods of handling or restraint in satisfactorily subduing the horse, and in doing a reasonably good service to the teeth he is fully justified in making an extra charge for the employment of the unusual methods resorted to in handling the horse.

Castration Fees.

The conditions obtaining in regard to fees here are almost identical with those of dental work.

The charge for castrating colts ranges from a fee of $1 in some localities in the middle West to a fee of $5 in some sections of the South and West.

While the $1 fee is without thought or question disgustingly low and ridiculous, the $5 fee is not in the least too high.

A peculiar circumstance in connection with

the variability in the charge for castration is that in the portion of the country where the best colts are raised the veterinary practitioner gets the smallest fee for the operation.

The castration of colts is looked upon in nearly all parts of the country as an insignificant procedure, one that can be performed without any special qualifications.

While this is the attitude of the public in regard to this operation, the loss of a colt from a castrating operation is looked upon as an unpardonable sin when the operator happens to be a veterinary surgeon.

It is for the latter reason, namely, that a loss in castrating is always a serious matter for the practitioner from the standpoint of prestige, that the veterinarian should endeavor to obtain a good fee for this operation. An item that has done much to detract from the esteem in which the laity hold an able emasculation is the standing operation. This method of operating has had the effect in some localities of lowering a castrating fee that was already below par.

In my opinion the standing operation is high at 50 cents. It is an innovation that should be condemned by the conscientious practitioner, because even under the most favorable circumstances the emasculation of a colt in the standing operation is a travesty on veterinary science. The practitioner knowingly places his client's interests in jeopardy every time that he castrates a colt in the standing position, and in my opinion any fee that the client pays the veterinarian for this kind of an operation is too high.

The restraint for colts about to undergo emasculation should be in the recumbent position, enabling the surgeon to observe the required antiseptic precautions most rigidly, and making it a simple matter for him to satisfactorily and correctly handle any abnormality that may be found during the course of the operation.

The emasculation of a colt under these conditions, the only conditions under which a graduate veterinarian is justified in making a charge for the procedure, is worth $5. The idea of a graduate veterinarian matching his services against those of an empirical castrator for a like fee is entirely wrong, in fundamentals and in principle.

It is a task for the coming generation of veterinary practitioners to overcome this attitude on the part of the laity by means of an educational campaign, as well as by the conscientious performance of the operation in the recumbent position of the colt. Young graduates beginning the establishment of a practice in new localities can do this without much difficulty.

As long as the graduate veterinarian castrates colts carelessly, in the standing position, or without regard for the principles of surgery, he is doing no better than the empirical practitioner and cannot with justice demand a better fee.

Fees for City Calls.

The fee charged by the practicing veterinarian for visits to sick animals within the corporate limits of the city in which he maintains his office is also quite variable.

In some eastern and middle West cities the fee for a city visit is as low as $1, while in a few cities in the West the charge for the same service is $2.50.

When we consider the fact that in very large cities a city call oftentimes means a drive of from five to ten miles it appears that the city practitioner offers his services too cheaply. If we figure the service on a mileage basis this is true.

The charge for a city visit should, however, never be less than $2. If the veterinarian dispenses his own drugs he should make an additional charge for medicine.

In the case of the country practitioner it is not always practicable to make such a charge for visits within the village limits. The charge for a visit in the village or town in a country practice should not usually exceed $1.50. Very frequently this charge must also include the medicine which is used in the case at the time of the visit.

Why the fee for town service in a country practice should be so low will be discussed in detail in a later article on the "Diplomatics of Veterinary Service," to which the reader is referred.

The fees for city visits in some of the large cities have been made higher during the past few years, and no doubt another increase will follow in the near future.

The loss of business because of the almost complete disappearance of driving horses in the cities has made an increase in the cost of veterinary service inevitable.

While a few practitioners have been able to offset this loss by the development of a canine and feline practice, many others have not been successful in this regard.

In some large cities there is already a comparative scarcity of veterinary practitioners, and this offers a good opportunity for the satisfactory adjustment of fees on the part of those practitioners now in possession of the field of practice in these places.

BUY A LIBERTY LOAN BOND

Blackleg Filtrate

By DR. A. EICHHORN
Lederle Antitoxin Laboratories, Pearl River, New York.

FOR the prevention of disease there is no biological product used as extensively and which has become so well established as blackleg vaccine. The good results which followed its introduction are now being recognized throughout the United States, and it may be safely stated that in blackleg districts a considerable proportion of animals are now being annually vaccinated with this product. The available statistical data proves the remarkable reduction of losses from the disease as the result of systematic vaccination

The most common method of vaccination against blackleg which is being employed, not only in the United States, but also in other countries where blackleg is prevalent, consists of the injection of attenuated virus prepared in either pellet or powder form. The number of annual vaccinations with this product amount to many million, and while the reports prove conclusively a marked reduction in the number of deaths following vaccination, nevertheless the results cannot be accepted to be uniformly satisfactory, as direct losses from vaccination are known to occur from time to time; and, furthermore, insufficient protection following vaccination is also of common occurrence.

The vaccine prepared in pellet or powder form is the outcome of early investigations on blackleg immunization by Arloing, Corvin, and Thomas to whom the honor belongs of developing the method of immunization known as the "Lyon Method." The principle of this immunization consists in the attenuation of dried juices from blackleg lesions of an animal which has succumbed to the disease. The attenuated material is subjected to two different degrees of attenuation: one being exposed to a higher temperature and used for the first injection, and the other attenuated at a lower temperature and used for the second injection. The injection is made into the dense tissue of the tail with the intention that the firmness of the tissue would prevent the rapid development of the reaction following the vaccination.

This method has been extensively employed throughout the world and the results might be considered highly satisfactory, although losses from vaccination and insufficient immunity have been observed from time to time. Furthermore, complications resulting from the injections, such as necrosis of the tail, etc., are not unusual.

Kitt in 1898, published the results of his experiments whereby he succeeded in simplifying the "Lyon Method"; his process requiring only a single injection, and he further recommended that it be made in the shoulder region where the skin is loose and easily pierced by the needle. For the preparation of the vaccine, Kitt utilized the affected muscle of the animal which was cut into strips, dried and pulverized in a drug-mill. The powder is then mixed with distilled water into a paste, filled into shallow pans and placed in the attenuating oven where it is subjected to a temperature of 95° C. for a period of six hours. The attenuated material is then ground into a powder which is prepared into either pellet or powder form (government vaccine).

In considering the method of preparation of the vaccine, it must be realized that the product is comparatively crude. Blackleg vaccine as marketed at the present time cannot be accurately standardized and a single dose may contain 100,000 or one million spores and at other times a much smaller number, if any. Such a variation would naturally result in irregularities of the immunizing action of the vaccine, and it is no doubt due to this fact that direct losses from vaccination and from the natural infection after the vaccine cannot be entirely avoided.

The shortcomings of the blackleg vaccine lie mainly in the fact that in its production the spore contents of the product cannot be accurately estimated. It is true that the vaccine is weighed or measured, but it is impossible to establish the amount of active virus which it contains. Not only is it impossible to determine the amount of living vegetative blackleg organisms and spores in the tissues used for the vaccine production, but it is also impossible to estimate how much of the active material will survive the attenuation. The variation of the amount of virus in the affected tissues of an animal is, no doubt, considerable and the effect of the attenuation upon the virus may also vary in the different lots used for the vaccine production. The former views

that the individual organisms of a culture or of an infected focus are biologically uniform can be no longer substantiated; and likewise, there is no longer any doubt that the individual vegetative forms or spores possess a varying susceptibility toward exposure to higher temperature. Accordingly, the reduction of the number of organisms following heating is not always uniform. Thus, it is impossible to determine whether the original material used for the vaccine production contained an insufficient number of organisms or spores, or to what extent they might have been injured or destroyed by the process of attenuation. There are no scientific methods known to overcome these deficiencies.

In order not to bring this method into disrepute, it would be essential to eliminate these shortcomings. It is a recognized fact that in blackleg vaccination sufficient immunity is only obtained in case the spores contained in the vaccine have actually germinated in the animal. To develop a vaccine of a potency which would be capable of inducing only a very slight infection and at the same time to limit its action within safe borders, so that the infection does not become too severe or fatal, has not been attained by the present method.

A further technical deficiency in the preparation of the vaccine from blackleg meat and juices, consists in the irregular consistency of the vaccine powder and of the emulsion prepared therefrom. It is natural that the preparation of a homogeneous solution from the powder is almost impossible and if the vaccine contains an insufficient number of broken up clumps, the results are naturally different than when a homogeneous emulsion is employed.

In view of the imperfection of the vaccine prepared from the affected parts of a blackleg carcass, investigators have directed their attention toward developing other methods of vaccination by which these deficiencies might be overcome.

Attention was then directed toward developing a vaccine consisting of the attenuated cultures of the blackleg organism. Kitt, Detre, Poels and others, have employed blackleg cultures in which the organisms were attenuated in various ways for the immunization against blackleg. The results were not uniformly satisfactory. However, in various localities one or the other method has established itself and is now being used to some extent.

Later, Leclainche and Valleé developed a liquid blackleg vaccine which they tested out very extensively, and it is now being employed in different countries with fairly good results. The shortcomings of the liquid blackleg vaccine must be recognized since it is subject to the same deficiencies as is the Pasteur vaccine for anthrax; viz. a careful standardization of the product is almost impossible; the keeping qualities of such a vaccine are limited; and furthermore, it is a recognized fact that the blackleg organism does not retain a uniform virulence upon artificial cultivation. These factors, no doubt, are responsible for the fact that the liquid blackleg vaccine is not attaining popularity for vaccination against blackleg.

With the advent of the development of the different immune sera for the prevention and treatment of diseases, the utilization of animals for the production of blackleg immune serum has also been undertaken. For this purpose, horses and cattle have been injected with cultures of blackleg, at first in small doses, which later are increased until as high as 500 c.c. are injected intravenously. Unfortunately, at the present time we have no means for an accurate standardization of such serum since it is a recognized fact that the laboratory animal tests are unsatisfactory for such purposes. The writer is now carrying out experiments by which the various products for blackleg may be more accurately standardized and the results along these lines are very promising. In the case of the serum, the complement fixation or agglutination may yield the desired results whereas with the other products, especially with the germ-free extracts and filtrates, the toxicity will have to be given consideration in the standardization of the products.

It is natural that the use of the serum for the control of blackleg has its limitations. The injection of an animal with serum induces only a passive immunity which at best would protect the animal for a period of only one month. However, in herds where the disease has already caused considerable losses, the animals might be subjected to the serum treatment, to be followed later by an active immunization.

For curative purposes, blackleg serum is known to exert a very favorable action, but in this instance also it must be recognized that the disease runs a very rapid course and in most cases the administration of the serum would be rendered fruitless.

More recently in this country, germ-free extracts (aggressins) have been highly recommended for immunization against blackleg. The products are obtained from animals artificially affected with the disease and from the affected muscle and fluids are extracted by pressure. The fluid thus obtained is frozen in order to facilitate the filtration of the liquid. After filtering and suit-

ably preserving it is marketed, about 5 c.c. constituting a protective dose for each animal. The results from vaccinations with this product are highly satisfactory and no doubt more reliable and uniform than with the blackleg pellets or with the powder. However, the cost of production of such extracts is considerable and therefore the stock owner, especially since he is accustomed to expend only a nominal sum for the products used heretofore for vaccination against blackleg, would not readily take advantage of this product.

The immunizing action of the extract, no doubt, is dependent upon the specific toxic substances (aggressins) which it contains, and in consideration of the limited amount of such extract which is available from an affected animal the attention of investigators have been directed to the production of such specific toxins (aggressins) in the laboratory; and with this in view special culture media containing a definite proportion of meat has been inoculated with active blackleg cultures which resulted in a very prolific growth with tremendous gas-formation.

On following this method of cultivation it is noted that in the first few days a very active propagation of the blackleg organisms takes place in the media, further, a disintegration of the meat is noted, and a heavy layer of blackleg organisms settles to the bottom of the container. In the first few days, upon examination, it is found the growth consists of the vegetative forms of the organisms, and with the diminishing of the gas-production, an increase of the spore form of the blackleg organism is noted. The conclusion of the growth is indicated by an entire cessation of the gas, and on the bottom of the container a heavy sediment consisting almost entirely of spores of the blackleg organism is present. At this stage, the meat appears to be disintegrated and becomes of a mushy consistency. For the preparation of the filtrate, the cultures are subjected to various procedures to facilitate the task of filtering out the organisms, since it is absolutely essential that the finished product shall be entirely free from the spores or from the vegetative form of the organism. The technic of this procedure does not require any special skill and consists chiefly of the laboratory routine, employed along the same lines as those used for the production of the different biological products.

This method of procedure has been developed in Japan where at the present time, the "germ-free filtrate" is used almost uniformly for vaccination purposes against blackleg. From information which I obtained personally from Professor Nitta of the Tokio University it appears that this product is placed above all others which we have at our command for immunization against bleckleg, and I have been told that the filtrate appears to afford a uniform protection; and, besides this, the losses following vaccination or incidental to vaccination are thereby entirely avoided.

In order to determine the value of this method of immunization, the writer undertook investigations along this line and substantiated in every particular the results obtained in Japan. In the course of the experiments, it suggested itself to determine whether other culture media than that described above might be employed for the production of germ-free filtrate and with this in view duplicate tests were made with culture media, one containing the meat and one without the meat. The results were very convincing as to the necessity of having the meat in the media, since the filtrate obtained from this culture media possessed great immunizing value when tested out on calves, whereas the filtrate prepared from the media not having the meat failed to show any signs of protection. It was likewise noted that the gas production in the media containing the meat was tremendous, whereas in the other flasks only a moderate gas formation took place.

In the dosage of the filtrate, the recommendations for the Japanese product were followed, namely, 5 c.c. for immunizing purposes. Since, however, it appears advantageous to reduce the dosage to a quantity which can be more conveniently handled, attempts were made toward concentrating the filtrate. This has been successfully accomplished in vacuum driers without subjecting the product to a temperature exceeding 40° C. The filtrate is then preserved with a definite percentage of glycerin to increase its keeping qualities.

Guinea pig tests which were at first employed exclusively for the standardization of the product proved that injections of 0.2 c.c., 0.3 c.c., and 0.5 c.c. of the concentrated material when followed in ten days or two weeks' time with an injection of virulent blackleg virus, produced a distinct immunity in the animals, since the control pigs, receiving the virus died, and the immunized animals survived. The tests on the guinea pigs should be carried out as follows:

In all eight guinea-pigs are used of which two serve as controls. Two of the remaining six receive 0.1 c.c.; two receive 0.4 c.c.: and two 0.6 c.c. of the filtrate. After ten days all pigs are injected with 0.5 c.c. of virulent blackleg virus. The virus is prepared by taking dried blackleg tissue, pul-

verizing it and mixing it with distilled water in such proportions that there will be about equal amounts of fluid and sediment. Of this coffee colored mixture, 0.5 c.c. is injected into each guinea-pig. It is required that at least four of the immunized guinea-pigs shall survive and both of the controls should die from the injections.

The product has also been subjected to other severe tests on calves, in which the calves after injections of the blackleg filtrate were subjected in two weeks' time to an injection of 5 c.c. of blackleg virus, an amount which is used to infect calves with blackleg for the production of vaccine. Five calves which have been inoculated in this manner resisted the infection and only in one instance did a swelling appear at the point of injection of the virus.

With reference to the duration of the immunity produced, all the investigations indicate that the period extends for about one year. That is, the same length of time as the immunity established by vaccine or by germ-free extracts. There is no conclusive information available whereby permanent immunity might be produced from the injection of any blackleg product. Of course, it is realized that the vaccination of calves with an effective product would induce an immunity which would protect the animal during its time of greatest susceptibility, and since the immunity produced by the vaccination vanishes only gradually, the proportion of infection in effectively vaccinated animals would naturally be very insignificant.

SUMMARY.

1. Blackleg filtrate is an effective immunizing agent against blackleg.

2. Blackleg filtrate confers an active immunity, which protects cattle against the disease for as long a period of time as the germ-free extracts (aggressins) prepared from the juices of the tissues from affected cattle.

3. Since it does not contain the blackleg germ in any form, it cannot produce the disease, therefore, losses incidental to vaccination with the powder or pellet form are entirely avoided.

4. Blackleg filtrate may be prepared in a concentrated form and when suitably preserved, will retain its potency for an almost indefinite period of time.

5. It is essential to subject the blackleg filtrate to the various tests for sterility, both during the filtration and filling processes in order to guard against any possible contamination.

In the *International Journal of Surgery* Coward, of Columbia, S. C., has a paper on the treatment of infected wounds. In reference to the use of carbolic acid he says: "We have thought and spoken of pure carbolic acid as something of the greatest potency, all-conquering in its fight with germs. The truth is, of course, that, speaking comparatively, pure phenol is a very feeble antiseptic; and in contending with the organisms which had obtained a firm hold on the nutrient medium of these fresh wound surfaces it was little better than nothing. Its bactericidal power, always feeble, is much reduced when it is called upon to act in the presence of serum or pus; and when used in full strength it is apt to damage healthy tissues."

Further along in the article he gives the following table of strength of various antiseptic solutions:

Antiseptic	*With Blood Serum*	*Without Blood Serum*
Phenol	1:250—	1:50—
	1:500+	1:100+
Salicylic acid	1:2,500—	1:100—
	1:5,000+	1:250+
Peroxide of hydrogen	1:3,500—	1:1,700—
	1:8,000+	1:2,000+
Iodin	1:100,000—	1:1,000—
	1:1,000,000+	1:2,500+
Bichlorid of mercury	1:15,000,000—	1:25,000—
	1:10,000,000+	1:50,000+
Nitrate of silver	1:1,000,000—	1:10,000—
	1:10,000,000+	1:25,000+
Hypochlorite of soda	1:500,000—	1:1,500—
	1:1,000,000+	1:2,000+

The plus sign indicates that the staphylococcus culture is positive and the minus sign that it remains sterile under exposure to the solution for two hours. This study was made by Daufrane.

He also has this to say of iodin: "Iodin, which is so useful for the sterilization of the skin, has given results much less satisfactory in the disinfecting of deep wounds, because it coagulated the proteins and irritated the tissues, and it has feeble power of penetration. Wounds treated by it continue to suppurate and cicatrize more freely than others."

M. R. Steffen, V. S., M. D. C.

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Food Conservation Necessary

THE United States Department of Agriculture is carrying on an energetic campaign to encourage farmers and stockmen to conserve all breeding stock. They urge that every influence be used to discourage "near-sighted profit taking" in selling for slaughter cows, heifers and sows that may be used for breeding purposes, even though good prices are offered on the market and feed is high. There exists a shortage of meat animals the world over, and indications are that this may continue for an indefinite length of time.

In a recent letter sent to publishers, the following recommendations are made:

"Feeds not available or needed for human consumption should be used as largely as possible in feeding live stock. By feeding straw or corn stover, especially for wintering mature stockers and breeding animals, farmers will make the best possible use of these roughages. In this way a large proportion of the straw and stover ordinarily burned or wasted can be manufactured into meat and milk. Grain sorghums, wherever they are available, should be fed to release corn for human uses. Grain, where fed, should be used as economically as possible.

"Every animal should be a factory for turning into food material inedible for human beings. This will necessitate changes in many feeding formulas and stockmen are urged to apply at once to the U. S. Department of Agriculture or their State agricultural colleges for information as to the most effective and economical methods of feeding live stock under existing emergency conditions."

In this connection, we are pleased to note that one of our subscribers is doing his duty in a manner that is commendable. We reproduce an article that appeared in the Times-Republican of Marshalltown, Iowa. The article is supplied us by a clipping bureau and is as follows:

VETERINARIAN DOES HIS BIT

Saves Sixty-two Yearling Heifers For Breeding Purposes.

Tama, May 7.—Dr. F. M. Maxfield, a veterinary surgeon of Tama, Iowa, showed his willingness to do his bit in food conservation last week when he was called to perform the operation of ovariotomy upon sixty-two yearling heifers for a south Tama county farmer. The doctor refused to perform the operations and offered to find the farmer a buyer for the heifers at a price equal to their value as beef in order that they might be saved for breeding purposes. These heifers will be a valuable addition to the country's food supply next winter as fresh cows, to say nothing of the value of the sixty calves thus saved to do their bit as well.

This act of the doctor's is considered as one which ought to be more common in

this country at this time especially and if the farmers can only realize the seriousness of the food situation none of them would even consider turning their heifers into beef.

PICTORIAL POSSIBILITIES FOR VETERINARIANS.

Any one who has had occasion to make an extensive study of veterinary literature has been struck with the fact that comparatively few good illustrations of typical or atypical conditions exist. Perhaps the chief reason for this dearth of helpful material is that opportunities for photographing the most suitable cases seldom present themselves.

In the first place the average veterinarian is not a photographer. Moreover, when he is called to see cases that are good subjects for illustrating pathological conditions, the surroundings or opportunities are not such as to meet the requirements of photography. It may be an emergency case when the practitioner has no camera or insufficient time exists to procure the services of a photographer even though the expense were thought justifiable, or as is frequently the case, calls at night preclude practical photography by the amateur.

Nevertheless, every veterinarian, whose practice is such that an occasional opportunity is presented for photographing cases wherein the subjects would make appropriate illustrations for our current publications and more especially for works of reference, should make a special effort to photograph or have photographed such cases. Unfortunately the general practitioner does not appreciate the value of such photographs. He is more often attracted by the spectacular, by what seems to him to be very unusual, such as animals that have suffered amputation of legs and monstrosities.

Often subjects that are typical and that would admirably illustrate diseased conditions, cannot be removed from quarters in which they are kept to suitable places for being photographed without jeopardizing their lives. This is true of acute constitutional disturbances such as pneumonia and pleurisy, and it is, therefore, difficult to get good illustrations of these cases that clearly portray expressions of the physiognomy during the critical stages of such affections. Characteristic attitudes depicting conditions such as acute gastric tympany in the horse or eversions of the uterus in the mare and certain cases of dystocia in the large animals, are very difficult to procure in photographic representations.

The purpose of this article is to appeal to general practitioners to avail themselves of every opportunity that is offered to photograph typical cases of any condition wherein the characteristics are not already profusely illustrated. Every practitioner has occasion to return to his office for the purpose of procuring necessary additional equipment to care for animals that are critically ill. If he does not possess a camera, he could pre-arrange so that he might telephone a photographer who could be in readiness to accompany him on such occasions. In this way, even difficult cases to photograph could be got without delay. It is not difficult to photograph wounds, yet how many "close up" illustrations of extensive or serious wounds showing the condition before and after treatment, do we see in our publications?

Practitioners may be assured that in taking pains to photograph animals when it is possible to portray something typical, they are lending valuable assistance to the veterinary profession, and in many instances such contributions will materially add to the available information on veterinary science.

J. V. L.

CRYPTORCHIDISM ILLUSTRATED

We trust it will not be amiss to call attention to a feature of this issue, which is the first appearance of colored plates illustrative of the regions concerned in cryptorchidism.

No pains were spared in the attempt to make the illustrations not only portray as much of this region of the anatomy as possible, but special care was given to have them accurate. While the embalmed structures have slightly altered the appearance of the tissues, nevertheless they are so nearly true to life that those who are not thoroughly familiar with the anatomy of this region may gain an accurate knowledge of the regional anatomy by a careful study of the illustrations and the captions.

In reproducing illustrated objects in this way, the subject to be illustrated must first be photographed or exactly reproduced by an artist, who subsequently must so color the various parts that when they are photographed for the purpose of making plates, the colors employed will set forth an exact reproduction of the original. Incidentally in work that is carefully done, the item of expense is not small; but in our efforts to serve our readers and present to them material of value and interest, we do not hesitate at the initial cost of any feature that we think will enhance the usefulness of our publication to the veterinary profession.

BOOK REVIEWS

Stedman's Medical Dictionary (Fourth Edition), edited by Thomas Lathrop Stedman, A. M., M. D., Editor of the Twentieth Century Practice of Medicine, comprises a number of features which commend it to students of medicine, whether graduates or undergraduates, and may wisely be included in the library of every veterinarian and veterinary student. It not only contains large additions to keep pace with the rapid progress of medical science, but shows careful elaboration and amplification of the content of former editions.

Among features of special merit is the presentation of Greek roots in English characters, which makes this important information available to veterinary students who have not a knowledge of the Greek alphabet. The use of phonetic syllables in respelling words for pronunciation is also very valuable. Preference has been given to simplified forms, especially in the elimination of diphthongs and the correlation of the use of some consonants, as the substitution of "c" for "k" in words of Greek origin. The definitions are concise and clearly stated; also kindred subjects are grouped to make them easily accessible.

William Wood & Company, publishers, are to be complimented upon the excellent workmanship, artistic arrangement and durable binding of the volume. Price $4.50 net. Wm. Wood & Co., New York.—C. D. Folse, D. V. M., Kansas City.

A Text-Book of the Principles and Practice of Veterinary Medicine

By David S. White, D. V. M., Dean of the College and Professor of Veterinary Medicine in the Ohio State University, Columbus, O.

This is a neat 484-page volume divided into eleven parts, wherein there is considered most affections of the domestic animals that interest the American veterinarian. The author states in his preface that the volume is designed primarily for the student of veterinary medicine and implies that its extreme brevity is purposive because other "books in this field have not been designed for undergraduate students; they are bulky, comprehensive works of reference of little pedagogic value; all of them have been superseded by newer editions in the original tongue."

It cannot be denied that the use of a well written though extremely brief textbook on this subject is of immense importance to the veterinary student. Instructors are well aware of the great handicap which besets every student who depends principally upon notes taken of lectures given in the class-room. This work if carefully read by students will serve as a substantial basis upon which they may later enlarge their knowledge of the subject.

If the author had in addition to crediting references where this has been done, cited publications from which such references were taken, it would have served materially to encourage students in further reading.

The discussion of diseases of the stomach and bowels is especially practical. On page 101 the author states, "To consider all conditions in the horse which produce more or less violent abdominal pain a specific disease, and to treat them all more or less alike, is unscientific and a menace to the patient." Many general practitioners would do well to carefully consider this statement and then to avoid routine treatment in digestive disturbances. Truly then as the author states, "Were it possible in all cases to make an accurate diagnosis the clinical term 'colic' would disappear from veterinary as it has from human medicine." Moreover, better results would attend the handling of cases of indigestion in the horse.

On page 113 in discussing treatment for spasmodic colic, the author presumably wishes to recommend the use of chloral hydrate, but through a typographical error "chloral" is named. This error is unfortunately chiefly in that it will tend to further encourage the already prevalent habit among students of referring to chloral hydrate in this manner.

On page 131 in the consideration of the treatment for traumatic indigestion of the ox, the author states "In a few instances surgical interference has been successful." Little encouragement is given the student to give surgical treatment in these cases.

Infectious diseases receive very able consideration and little space is devoted to diseases not indigenous to this country. It is quite obvious that the author does not advocate the general use of bacterins either for preventive or curative purposes. Like many others, he does not appreciate the reliability and practicability of the intradermal test for tuberculosis in cattle. In grouping the several methods of employing dermal tests, he states that the intradermal method "is still in the experimental stage!"

The author employs throughout the book the old anatomical nomenclature. A combination of both the old and the new would have proved very helpful to students.

A very commendable though unpopular feature in the work is the scarcity of set prescriptions and formulae. This it is hoped will tend to discourage the unfortunate propensity of students and practitioners to copy formulae rather than to attempt to master therapeutics.

Cloth bound, price $3.25 net. Lea & Febiger, Philadelphia.

J. V. L.

Pathology and Differential Diagnosis of Infectious Diseases of Animals, V. A. Moore, 4th Edition.

This volume is a well written description of the various infective diseases of animals including those diseases caused by various bacteria, yeasts, moulds, protozoa, filtrable viruses, as well as some apparently infectious diseases of unknown origin.

Chapter I includes a description of the general principles of infection, in which the author has given definitions and concise explanations of the most important terms pertinent to the subject of infection and infectious diseases. In this chapter, there is found a classification of bacteria, which is found to be the basis of the classification and arrangement of the various bacterial diseases. There is also a brief consideration in this chapter of navel ill, white scours in calves and some other less important diseases.

Chapter II contains a description of the various conditions caused by streptococci.

Chapter III is devoted to a consideration of micrococci and the disease takosis.

Chapter IV is important, for it includes a consideration of the diseases caused by non-motile, rod shaped bacteria, viz.: the diseases of the hemorrhagic septicaemia group, anthrax, glanders, tuberculosis, Johne's disease, infectious abortion and some other diseases.

Chapter V contains the description of those diseases caused by motile rod shaped bacteria, as salmonellosis, necrobacillosis, tetanus, blackleg and malignant edema.

Chapter VI is devoted to a description of the higher bacteria and to a specific consideration of actinomycosis and related conditions.

Chapter VII. In this chapter, there is found a general consideration of fungi and some of the more important diseases caused by the same.

Chapters VIII to XII inclusive, contain descriptions of protozoa and protozoon diseases, in which is found a consideration of spirochetosis, amebiasis, piroplasmosis, trypanosomiasis and micro-sporidiosis.

Chapter XIII. In this chapter, the author has grouped the various diseases, in which the causative factor is still undetermined and those diseases caused by filtrable viruses.

Chapter XIV is of special importance, for it contains a general description of immunity and protective inoculations.

Chapter XV is devoted to a general consideration of disinfection, in which is included a brief description of variability of various bacteria to disinfectants, variable conditions encountered in disinfecting, and to some of the disinfectants.

Appendices I and II, are brief statements of the sanitary requirements of the various states and the regulations governing meat inspection in the United States.

In reviewing this volume one is forcibly impressed with the concise descriptions, systematic arrangement, and clear cut illustrations found therein. The uniformity of the scheme followed by the author is of material assistance to students and will be appreciated by those using this volume as a reference book.

The subject of differential diagnosis is given careful consideration and will be of very great value to those concerned in the diagnosis of the various infective diseases. Although the description of some diseases may seem rather lengthy, the subject matter as a whole is relatively condensed, but yet easily understood.

The author has not confined his descriptions to disease found in any one locality or country but has included the description of the most important diseases found in all parts of the world. As an American publication, some may criticize this volume because of the space devoted to diseases primarily of foreign countries and for the brief mention that is given to the prevalence in the United States of such diseases as anthrax and hemorrhagic septicaemia. However, the description of diseases of foreign countries is valuable in a book of this character, as efficient sanitary officers should possess knowledge, not only of the diseases of their country but also of foreign countries. But it is probable that this volume would be read with more interest by Americans if the description of the diseases found in the United States contained less consideration of the same diseases in foreign countries.

The value of the portion of the appendix referring to sanitary regulations in a book of this character is doubtful because of the frequent changes of sanitary officials and also of the regulations.

The bibliography is quite complete and will be appreciated by investigators and others who are desirous of further knowledge.

This volume is of value to sanitarians, practitioners and students of veterinary medicine and should not only be found in the library of those interested in comparative medicine, but it should also be frequently used as a vast amount of classified accurate valuable information is contained therein.—A. T. Kinsley.

Cloth bound 593 pages, 120 illustrations, price $4.50 net. The MacMillan Company, New York.

Department of Surgery

By L. A. MERILLAT, Chicago,
Professor of Surgery in the McKillip Veterinary College

Pitfall No. 20

Prognosis

AS THIS is the season of the year when many young practitioners are entering upon their duties for the first time, it might not be amiss to sound a warning about the dangers of venturing into the realm of prophesy too freely while deliberating over their first patients.

The domain of prognosis is full of ugly, deep and very dangerous pitfalls that trap even the old, experienced practitioners. It is however the recruit who should heed them. The knowing veterinarian, that is, the experienced man takes a circuitous route around the pitfalls in prognosis; the youngster walks right into them. Over-confident of his knowledge of pathology the youngster falls into the traps, whereas the "old head," having an intimate acquaintance with amphibology, passes safely over. He was taught in the school of experience that the course pathological processes may take is clouded with uncertainty; that they have a trend too freakish to be pre-determined; and that they have a way of taking unexpected turns at unexpected moments to the utter dismay of the too willing prophet.

The young practitioner invariably digs his own pitfalls by forthwith talking too much. Taking advantage of his first opportunity to display his vast medical vocabulary he imprudently proceeds to deliver long lectures over his patients. And this he does before having learned the fine art and the wisdom of ambiguity at which the old practitioner is a pastmaster.

Unprotected statements that patients are fatally stricken, that they are incurable and should be shot, that it will not pay to treat them, that they will recover at a definite time, that they are sure to recover, or that their ailments are trivial, are so many very unwise prophesies that will surely ensnare the incautious, over-confident youngster who indulges too freely in them. Avoid them if you would succeed, clothing your statements with a more cunning ambiguity. If this is deceit, it is born of necessity. The conscience must seek relief in the mystery and tricky trend of disease processes even when their character and location are discernible.

The following conversation overheard by the writer a few days ago—the inspiration for these remarks—illustrates the point:

DR. DOE: (Driving up to a farm barn in response to a hurry-up call). Hello, Bill, what's the matter?

CLIENT: Hurry up, doc, I've a darn sick horse. I don't know what ails 'im, but he's awful bad. Been sick since noon.

(Dr. Doe hastens into the stable and finds a horse down in a single stall, soaked in perspiration, cast with its head under the manger and kicking with all fours.)

CLIENT: What do you think's the matter with 'im?

DR. DOE: I can hardly tell until we get him out of there.

(Everybody pulls and the horse is soon up on its feet, but soon cramps and falls down again in the aisle.)

CLIENT: What do you think of 'im, doc?

DR. DOE: Well, he seems bad enough. Go out and get a bucket of hot water in a clean pail.

FARM HAND: Think you can pull 'im out?

DR. DOE: Go and get a decent halter so that we can handle him. Bring one with a good long shank.

CLIENT: (Returning with a pail of steaming hot water.) What do you think's wrong with 'im?

DR. DOE: Get some wisps of straw, all of you, and rub him dry. Rub hard and get a good warm blanket.

CLIENT: Don't you think it's his water?

DR. DOE: That water is too hot, see if you can get some cold to temper it.

CLIENT: (Returning with a pail of cold water which he pours into the hot to cool it.) How's this? Is that cool enough? Do you think you can save 'im? I'm afraid he's going to die. What do you think?

DR. DOE: I have seen sicker horses recover. Close that door and that back window. It's entirely too drafty in here for a sick horse.

CLIENT: Doc, what do you think's the matter with him?

DR. DOE: Now hold his head 'til I give him this medicine. (The doctor administers a capsule.)

CLIENT: Gee, he's awful sick. I'm afraid he's gone. What do you think?

DR. DOE: Now hold that tail aside while I give him this injection and be careful you don't get splashed up.

(After giving the enema the client is kept busy for half an hour walking the patient about in the yard.)

CLIENT: (After returning the horse to the stable.) I'm afraid he's getting worse.

DR. DOE: (No reply. Administers another capsule and goes out to the automobile for his hypodermic.) Now bed down that big stall back there with lots of straw. Hurry up before he gets cast again in this narrow place. (Everybody is busy for ten minutes preparing the new quarters.)

DR. DOE: (Leading the horse into the new stall, where it immediately throws itself and stretches out full length). Now let him alone.

FARM HAND: Jimminy crickets he's awful sick.

CLIENT: By gad, I'd hate to lose that horse. (Anxiously.) Do you think he's getting better?

DR. DOE: Now, Bill, I wish you would ring me up at six o'clock and let me know how he is. I have another call to make and will be home by that time.

CLIENT: Do you think his water is all right? I haven't seen him make water today. Don't you think you ought to draw it?

DR. DOE: Look out there and don't let him get cast against that wall. (Everybody gets busy pulling the horse away from the wall.)

CLIENT: He's breathing awful hard doc. I wonder if he's getting lung fever. What do you think's the trouble?

DR. DOE: It seems to be a very serious obstruction of the bowels. Now give him this medicine every half hour and don't fail to ring me up at six.

At six o'clock the horse is reported still colicky, but improved, but another call is made on suspicion that the favorable report is due to bad judgment.

On this visit the pulse is found failing, respirations shallow and fast, body soaked in cold perspiration, extremities cold, body shivering and membranes highly injected.

CLIENT: Well, what do thing of him now?

DR. DOE: (Gravely.) Bill, there is no help for him. He has a fatal inflammation of the bowels and can not recover. (In ten minutes the horse falls over and dies.)

Here is a display of cunning that neither compromised the doctor nor created any suspicion of his inability to make a prognosis on the first visit. Everybody agreed that everything was done to save its life, because the doctor kept them all busy every minute, and he knew it was a bad case by the way he made them all work. In short an implied prognosis was given, but there was no pitfall to fall into.

Notice also that the diagnosis was guarded in the general term "inflammation of the bowels," although the doctor had confided to me right from the start that he thought it was some form of gut tie. To have stated even this much might have been a mistake because a post mortem might have failed to show any such condition.

No. 21.—An old experienced veterinarian delivered a pure bred Herford of a fine calf, leaving instruction to notify him if the after birth did not come away in due time. One hour later the mother delivered herself of a twin brother, one just as fine as the other. Moral: Post operative examinations are often worth while even in simple cases of parturition. L. A. M.

Some Facts About Abortion Disease

By E. C. Schroeder and W. E. Cotton, reprinted from Journal of Agricultural Research, Washington, D. C., April, 1917.

Practically the same data regarding abortion disease in cattle as appeared in an article by the same authors in the February issue of the AMERICAN JOURNAL OF VETERINARY MEDICINE, is contained in this treatise. The writers claim they have enough evidence to prove at least two facts; namely, that the udders of cows are a common habitat of abortion bacilli, and that the bodies of non-pregnant cows do not harbor abortion bacilli elsewhere than in their udders. To prevent spread of abortion disease it is recommended that owners have tests for the disease made in all cattle to be admitted to their herds, also that they carefully dispose of aborted fetuses, afterbirths and discharges from the vaginas of infected cows. The treatment of individual cows should be left to the practicing veterinarian. Douching is said to be good practice, but the use of germicidal solutions in such a cleaning of the uterus is discouraged on the ground that solutions strong enough to kill bacteria may also prove harmful to the tissues.

Queries and Answers

The editor will reply to queries appearing here, as he is able and as opportunity permits, but he does not want, nor cannot undertake to monopolize this portion of the department. Any reader who can furnish further and better information in reply to any query is urgently requested to do so. Where the treatments advised in these replies is adopted it is hoped that those employing them will report their results whether good or bad. In all cases give the number of the query when writing anything concerning it.

QUERY No. 295. I have been treating a coach mare for paralysis of the sphincter and bladder for the past six or eight weeks and have failed to get results. She was treated with the following: nux vomica, two drams every two hours until six doses were given; then every three or four hours alternating every third day with Fowler's solution. Soft feeds were given and she was turned out to grass. Please advise what line of treatment should be followed.

REPLY BY DR. QUITMAN: This condition is due to pressure upon some portion of the spinal cord. Put your patient on two-dram doses of potassium iodid given in solution three times daily about an hour before feeds. This may have to be continued for several weeks.

QUERY No. 296. In those cloudy conditions of the eye where there is inflammation, is it in the anterior chamber, or does it involve the membranes covering the anterior chamber? What is the best treatment to use in those conditions? What is the action of echinacea?

REPLY BY DR. QUITMAN: This cloudiness may be in the anterior chamber of the eye if from a general inflammation, or it may be an opacity of the cornea. The following will prove useful:

℞

Ungt. hydrarg. nitratis	ʒi
Oleati hydrarg.	ʒii
Adeps lanae hyd	ʒiv

M. Sig: Rub in gently twice daily on the upper and lower lids, also in a margin of about two inches around the orbital fossae and into the skin of the supra-orbital fossae. If there is no improvement in a week or ten days, give two-dram doses of potassium iodid three times daily internally.

Echinacea is a cardiac stimulant and alterative useful in blood dyscrasia of various kinds.

QUERY No. 297. Will some one give me a good treatment for opacity of the cornea in horses as a result of irritation. My treatment has been three grains silver nitrate to an ounce of distilled water. I sometimes have a case where there are little abrasions of the cornea and the remainder will be covered with a bluish white opacity. —C. C. M.

REPLY: See Dr. Quitman's answer to the preceding query.

QUERY No. 298. I should like to learn from some experienced practitioner about the use of Pituitrin in sows after labor has ceased.—F. H. B., Kentucky.

REPLY BY DR. W. F. BROWNLEE: I have used "Petuitary Extract" in one mil-doses injected deep in muscular tissue of hip, repeated in from one to three hours if necessary, with some very good results in cases where sow has ceased to labor, and no mal-presentation exists. Liberal injections of carbolized oil in the vagina at the same time are of great assistance. Very satisfactory results will be obtained with Pituitrin if it is used in time and in cases where it is indicated.

QUERY No. 299. Dr. Kaupp's "Animal Parasites" mentioned the rabbit as a host for Taenia serrata, and mentioned only the cystic form. In this locality practically all grown rabbits are more or less infested with Cysticercus pisiformis and also the mature tapeworm.

Partial description: Head small, neck (so called) three to four inches, body (segments) from fifteen inches to two feet, color yellow. Often there is a plurality of grown taeniae and the host suffers a diffuse parietal peritonitis.

Assuming the rabbit's abdomen is not perforated with shot, I find the taeniae first in the small viscus, which I believe is their natural habitat, scolex and neck showing plainly through the viscus. If the autopsy is performed immediately after death, the small

intestines are in motion for some time. The scolex is easily pulled out with the neck.

Second, in the peritoneal cavity free moving. Third, in the peritoneal cavity with their scolices and about one-sixteenth of an inch of their necks buried in any part of the rabbit's viscera except the stomach. They do this probably trying to get away from the light.

I should like to know the name of this taenia. Is it different from Taenia serrata? What are the grown taeniae doing in the peritoneal cavity?

Belle, Fla. J. D. PAWLETTA.

REPLY BY B. F. KAUPP, M. Sc., D. V. S.—The Taenia serrata in the adult form is found in the intestines of the dog. The larval or cystic stage is found in the peritoneal cavity of the rabbit and is called the Cysticercus pisiformis.

According to Ostertag the Cysticercus pisiformis quite frequently undergoes a caseous degeneration, not only in the interior but also upon the surface of the internal organs. The cysticercus disease of rabbits may appear in an epizoötic form and may give rise to confusion with tuberculosis, in consequence of the caseation of the parasite. Hunters wrongly called the alteration in question a syphilitic process, or a venereal disease of the hare.

The dog becomes infested with Taenia serrata in eating the viscera of rabbits or hares containing these live cysticerci. When these have reached the intestine of the dog, their caudal vesicle contracts and becomes detached; the same occurs with the body. The scolex fixes itself on the mucous membrane, and its posterior part produces, by incessant gemmation, new segments. Twelve days after their introduction into the digestive tract of the dog, the taeniæ are one to three centimeters long, and in about twelve months their development is so advanced that the last segments are mature and commence to be detached. The ripe ova given to rabbits become cysticerci. It is then, by the proglittides that are expelled with the feces, and the ova which escape from this and are scattered over the grass or carried by water, that the dog is the cause of the introduction of this parasite into the organism of the rabbit.

The scolex of this cystercus or of the taenia is provided with two circular rows or rostellum of hooklets. There are from 34 to 38 hooklets in all.

I am very much interested in what Dr. J. D. Pawletta says about tape worm infestation of the peritoneal cavity of the rabbit and should like very much to have some specimens sent to this laboratory for study.

QUERY No. 300. A few days ago I was asked to dehorn a large vicious bull and after removing one horn, during which process I had a difficult time in spite of all reasonable means of restraint at my command, I decided to resort to H-M-C. I administered two formula-B tablets, waited twenty minutes and gave two more, then waited fifty minutes, when I cast the bull and proceeded to remove the second horn. This was done without resistance on the part of the animal after the first struggle, but upon completion of the job, he had gone to bull heaven. This animal was in prime condition but not excessively fat. I am anxious to know if the surgical shock is alone responsible.—E. C. M.

REPLY BY J. V. LACROIX—It is probable that surgical shock is responsible for the death of this bull, but to say that it alone is responsible, is to be presumptuous. We know from experience that the condition which we recognize as surgical shock is a suddenly appearing and more or less marked depression that attends serious physical or mental disturbance. Where the disturbance is of sufficient violence, there occurs cardiac and respiratory arrest, and this is usually preceded by a marked fall in blood pressure. The amount of morphin and hyoscin given in this instance was not sufficient to materially contribute to the occurrence of shock. It is quite likely that the violent struggling of the bull in resisting restraint was directly responsible for the unfortunate outcome.

QUERY No. 301. Will some one give his pet prescription for a general tonic.—C. C. M.

REPLY BY DR. QUITMAN: It is presumed that this is intended for a horse, and as a tonic in powder form the following is excellent:

℞

Arsen. trioxidi	℥ss
Quin. sulph.	℥vj
Ferri sulph. exsic.	℥jss
Nucis vom. pulv.	℥ij
Potas. nit.	℥iij

M. ft. Chart No. XII.
Sig: One powder t. i. d.

If a liquid is desired, a good prescription is as follows:

℞

Strych. sulph.	gr.xij
Ac. citrici.	℥ss
Aq.	℥j

M. ft. sol. et ad

Quin. sulph.	℥ss
Tr. ferri. chlor.	℥ij-iv
Alcoholis	℥viij
Syrupi q. s. ad	Oj

M. Sig: Two ounces in one-half pint water, t. i. d. after meals. (Dissolve the quinin in the iron.)

QUERY No. 302. What is the physiological action of sodium cacodylate?—J. O. R. C.

REPLY BY DR. QUITMAN: It is the same as that of arsenic, but when administered hypodermically, which is the best method of using it, it is far less toxic. An article fully describing the actions and use of sodium cacodylate appears in the May issue.

QUERY No. 303. What is the action of iron arsenite when the triple arsenates are given? Is it absorbed?

REPLY BY DR. QUITMAN: The action of iron arsenite is simply that of arsenic and iron, into which it is split up in the stomach. The iron is absorbed either as an albuminate or chlorid of iron. The arsenic is absorbed without material chemical change directly from the stomach if that organ is empty. If full, it is carried into the intestines and absorbed from them by means of the lacteals.

QUERY No. 304. What is generally used for the treatment and prevention of cryptogamic poisoning in cattle due to eating ensilage that is fermented or affected by pink rot? I have had one case die. The symptoms were staggering, salivation, gradual loss of appetite, and finally complete loss of appetite, gradual emaciation and death from complete exhaustion. I treated this steer with no benefit and have another one in the same herd that is doing no good. I used saline and oil as cathartics and turpentine, sodium hyposulphite, aromatic spirits of ammonia, spirits nitrous ether, stimulants, etc. The steer that is sick now is gradually getting worse and I want to be better prepared to treat any new cases that may occur. A peculiar thing in both of these cases was that the affected steers were the poorest eaters in the herd; always waiting until the other cattle had eaten their feed, then eating what had been picked over. They are of the narrow "slab-side" type of cattle. It seems strange that these animals that ate the least should be first affected, unless the other cattle noticed the difference in taste and rejected the moldy or frozen food. H. I.

REPLY BY DR. QUITMAN: So far as prevention goes, the only possible prevention lies in the removal of the cause, and in the case you describe the cause being known, this should be easy. The condition you describe is one of the many forms commonly called forage poisoning. There is no specific in this condition as the fatality depends to a great extent upon the kind or character of the poison consumed, the resistance of the animal and whether the ailment manifests itself in the acute or subacute form. The most satisfactory treatment thus far known is a quick acting purgative in acute cases followed by liberal doses of saline purgatives, or should the quick acting purgative not be indicated, by all means use the saline purgative. In conjunction with this, permanganate of potash and aluminum sulphate are two drugs of some value in this disease. These should be given well diluted. Stimulants and other symptomatic treatment should be administered as indicated.

The reason that the poorest eaters and least thrifty steers come down first is natural because of their lower resistance.

QUERY No. 305. Is the new anesthetic mentioned in connection with the clinic at the Missouri Valley meeting at Omaha a secret preparation, and if so what is charged for it?—W. L.

REPLY BY DR. QUITMAN: The anesthetic is as follows: For young dogs and cats use ether and aromatic spirits of ammonia, equal parts. For adult dogs, at least over two years of age, use the A. C. E. mixture, which as you no doubt know consists of alcohol one part, chloroform two parts and ether three parts, using this combination with an equal amount of aromatic spirits of ammonia. In other words, with one ounce of the above, use one ounce of aromatic spirits of ammonia. The aromatic spirits of ammonia is added because it renders anesthesia much safer and quicker, which it does by virtue of its being a respiratory stimulant, quickening and deepening respiration, thus producing anesthesia sooner, and by virtue of its cardiac stimulating action, it renders anesthesia safer and the patient recovers from the anesthesia much quicker than it otherwise would.

QUERY No. 306. On April 5th I was called one-half mile above town to see a four-year-old filly. The owner had driven her to town in a walk and on nearing home, she showed signs of being choked. He came for me as fast as he could and I arrived there within thirty minutes from the time she first showed signs of choking, and on examining her, found her lungs almost filled with a frothy fluid which completely filled them in just a few minutes. I autopsied her and could find no foreign body of any kind. The lungs were completely filled with this yellow serum. This filly had never had a sick spell and had eaten her feed that morning. I should like to know the cause of this rapid filling of the lungs.—A. C. D.

REPLY BY DR. F. F. BROWN—It is evident this case was one of pulmonary edema, which disorder is characterized by an exudation of serous fluid into the bronchioles and alveoli of the lungs. Pulmonary edema is rarely a primary affection, being dependent in the ma-

jority of cases upon some pre-existing condition, that seriously impairs the free circulation of the blood through the lungs. Such impairment exists largely in obstructive areas in the lungs, as may arise incident to hepatization, tuberculosis or tumor growths; also from new growths that may encroach upon the pulmonary veins, general cardiac weakness resulting from previous disease, and insufficiency of the heart valves, with especial reference to the mitral, whose imperfect closure permits a reflux of blood toward the lungs at each pulsation of the heart.

It is inferred, that no history indicates that this animal displayed any previous symptoms such as would excite the attention of the owner, therefore the opportunity for making a careful study of the pre-existing morbid state did not present itself. It is recognized that attacks of pulmonary edema are usually precipitated by excitement, exertion, overheating the body, and so on, some or all of which may have been a factor in this particular case, the animal being of an age when it would be more easily disturbed by such influences. Had an opportunity presented itself by which an examination of the thoracic cavity could have been made, it is quite likely dull sounds would have been elicited on percussion, and a diminished vesicular murmur heard on auscultation. Both crepitant and moist rales prevail in these cases. The chief diseases needing differentiation are bronchiolitis acute pulmonary hyperemia and hemorrhage from the lungs. The first two diseases mentioned being inflammatory in character serve to promote thermic disturbances not observed in pulmonary edema. The frothy, serous discharge from the nostrils seen in edema is of a hemorrhagic character in those associated with inflammation, while in hemorrhage from the lungs it is of a decided sanguinary character.

Trichlor-Tertiarybutyl Alcohol Anesthesia

By L. W. Rowe, Research Laboratory, Parke, Davis & Co., Detroit, Mich.

The description, action and uses of trichlor-tertiarybutyl alcohol in anesthesia of animals are set forth in this pamphlet. The trade name of this drug is "Chloretone." It is recommended especially for anesthetizing animals in experiments where the recovery of the subject is not essential, as it produces a long and steady anesthesia, the pulse rate being only slightly lessened and the heart action remaining good. Thus it is particularly adapted for experiments upon the blood pressure. If the recovery of the animal is desired, preliminary narcosis should be produced by a hypodermic injection of morphin followed by an injection of Chloretone in a smaller dose than when the drug is used alone.

Immunity in Tuberculosis

Munch & Leschke (Munch. Med. Wochen. No. 24)

These authors carried out extensive investigations on this subject. In order to bring about a reaction in tuberculosis it is not necessary to utilize all the constituents of tubercle bacilli (partial antigens), but each partial antigen (proteid, fatty acids, lipoids, neutral fats, toxins) may each produce a reaction of hypersensitiveness.

The reaction of hypersensitiveness is a more delicate tuberculosis reagent than the complement-fixation, since the latter may be obliterated by the inhibiting substances. In various species of animals the production of specific complement-fixing tuberculosis antibodies may be produced with varying readiness, with a preparatory treatment of tubercle bacilli suspension; this is accomplished most readily in goats, with more difficulty in rabbits and guinea pigs, and with the most difficulty in cattle.

There is no relation between the amount of complement-fixation or the tuberculosis antibodies producing hypersensitiveness, and the degree of immunity for tuberculosis.

For the production of immunity in tuberculosis it is necessary to undertake a treatment with all ingredients of the bacillus of tuberculosis (partial antigens); if one of these partial antigens is missing it is not possible to induce an active immunity.

It is possible to produce, with dead tubercular virus, a true hypersensitiveness for tuberculin, as well as under certain conditions a strong tuberculosis immunity.

In the self immunization of man the passive immunization against tuberculosis is also dependent upon the presence of all partial antibodies. A passive protection against virulent tuberculosis infection was successfully established with the serum of a tuberculosis-immune person, containing all partial antibodies. The serum of the same person at another time when it no longer contained all of the partial antibodies, proved without effect in experimental attempts to produce passive immunization.

All experiments with tuberculosis immune sera, leukocytic emulsions, and suspensions of erythrocytes, for the inducement of a protection against tuberculosis gave negative results. This was also the case with organ extracts of tuberculous and tuberculosis-immune animals, in attempts to transmit a protection against tuberculosis.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

It is the intention of the writer to use these columns to discuss the subject of poisonous plants. I shall, therefore, be glad to have readers of the American Journal of Veterinary Medicine send specimens of alleged poisonous plants to me. The queries will be given prompt attention.—L. H. P.

Is the Ohio Buckeye Poisonous?

DR. S. R. HOWARD, of Hillsboro, Ohio, sends me the folloiwng interesting notes on the Ohio buckeye (*Aesculus glabra*) and an interesting clipping from the Literary Digest.

"Buckeye is an American name for the different species of horse-chestnut (*Aesculus*) native to the United States.

"The species commonly distinguished are the sweet buckeye (*AE. flava*), the Ohio or fetid buckeye (*AE. glabra* and the variety *arguta*), and the California buckeye (*AE. Californica*).

"The kind I am most interested in is the Ohio or fetid buckeye (*Aesculus glabra*). Colloquially called 'bugeyed.'

"Is it poisonous?

"This has always been an open question with me, with the buckeye having the benefit of the doubt.

"I know it is a popular belief and is commonly reputed that animals become buckeyed and I have known of veterinarians, who should have known better, to wisely declare their patients to be buckeyed.

"I am not knocking, I am only seeking the truth. In my own mind I am almost tempted to place the term 'buckeyed' in the same category with 'forage poisoning,' 'that asylum for universal ignorance' as Prof. Fish calls it. I have seen large groves of buckeye trees in wood pastures where stock of all kinds ranged most of the year. I have seen cattle eating the fallen ripe fruit of the Ohio buckeye and they apparently suffered no ill effects. In Switzerland sheep are fattened on two pounds of ground horse-chestnuts fed night and morning. The name horse-chestnut received its name from the former use of the fruit when ground as food for horses.

"I have opened the stomachs of a number of cattle months after the time of falling of buckeyes and found handsful of the whole fruit in them. These several cattle died of various causes. I once attempted to feed some whole buckeyes to my own cows, but the buckeyes remained in their boxes until I threw them out weeks after. I have been told of crushed Ohio buckeyes being used as soap by some of the hill people. I have often thought I would sometime try this myself. I have it on good authority that in Europe, especially in Germany, deer and such animals in zoological collections are wintered largely on horse-chestnuts (*A. Hippocastunum*), and sheep and poultry are fattened altogether on the same and the leaves are used as bedding. Of course these chestnuts are a different species from the Ohio buckeye (*AE. glabra*).

"The California buckeye is used for food by some Indian tribes. It may be that some one species or more are poisonous, but as to the Ohio buckeye, I must say with the Scotch 'I hae me doots, I hae me doots.'

"Perhaps in your valuable book you thrash out the buckeye question thoroughly. If I had a copy (and I am sorry I have not), I might not have needed to write you. Again, —are Ohio buckeyes poisonous to domestic animals? It is possible we are wasting a food supply for animals. I consider the Ohio buckeye a strikingly handsome and beautiful tree, the only drawback to it is that its leaves fall early, often in midsummer."

We have in eastern United States the sweet buckeye (*A. octandra* and the variety *hybrida*) the *A. Pavia*, the horse-chestnut section consisting of the European horse-chestnut (*A. Hippocastanum*) frequently cultivated. Then

there is the fetid or Ohio buckeye (*A. glabra* and the variety *arguta*). The variety is found chiefly from Iowa to Texas. In the south there is a dwarf and beautiful shrub (*A. parviflora*) and in California the *A. Californica*. The horse-chestnut has a large amount of food material in per cents consisting of starch 42, albuminous matter 5, oil 2.5, sugars 9, mineral matter 1.5, water 40. According to the *Literary Digest* the amount of starch as given by other authorities is 14 per cent. The German chemist Serger gives an account of how it is used by boiling and removing the bitter principles. The horse-chestnut and our buckeye contains several glucosides and a saponin-like substance which Rochelder called aphrodescin. This is the reason it is used as a substitute for soap. All the saponins are more or less hemolytic in their action. Dr. Millspaugh says the prominent symptoms are confusion of mind, vertigo, stupefaction and coma. In my "Manual of Poisonous Plants," p. 617, I make the statement that it is fed to sheep and goats. The glucosides given are asculin, aesculetin, paviin. The aphrodescin is an amorphous acrid principle. The saponin occurs in other plants of the family which are regarded as poisonous. The fact that it is used by wild game and some domestic animals is not an argument against its poisonous properties. In Switzerland sheep are said to receive two pounds morning and evening. The fact that Dr. Howard has observed that cattle will not eat the seeds is a pretty good argument that it is not very palatable. I do not think that the cases of poisoning from the seed of this plant are numerous. I think that we may well believe that season and climate may have something to do with poisoning from this plant. There seems to be some misapprehension as to why the horse-chestnut was so called. It is said to have received its name because given to horses to reduce short windedness.

Are Frosted Sugar Beets Injurious?

A veterinarian writes as follows: "On Dec. 22, 1916, I answered a hurried call to a farmer's place to look at some hogs. This farmer had something over one hundred head of hogs weighing around 225 pounds each. Their ration consisted of ear corn and raw sugar beets; salt and wood ashes were constantly before these hogs, also good clean fresh water in abundance.

"On this particular morning the farmer cooked these beets (which had been frosted) and fed them to the above mentioned bunch of hogs, also put out a fresh supply of salt and ashes. He fed this to the hogs about 8 a. m., and about 12 n. went out and found eleven of his hogs dead and several lying around.

"He was unable to give me any symptoms or any history other than the above. We could see in the pens and runways where the hogs had vomited."

I am not aware that any cases of poisoning have been reported from frosted beets, though other plants like frosted cane and rape have been reported as injurious. Sugar beets are known to produce renal calculi in sheep.

MOULDY SILAGE AND STRAW

I have the following interesting letter from Dr. A. C. Schmidt, Ceylon, Minn., in regard to what appears to be silage poisoning in part.

"Having had trouble with mouldy silage poisoning, I come to you for a little advice. The case I wish to lay before you is as follows: One of our most successful farmers has been feeding ensilage to both horses and cattle this season until silo No. 1 was empty. Silo No. 2 had been opened and fed from three to four days when a three year old steer was affected with forage poisoning and died within twenty-four hours. (This ensilage was in poor condition and rather mouldy.) The next day one of the best young horses went with the same symptoms; the next day another one. I diagnosed this as ensilage poisoning and no more ensilage was fed to horses. Just six days later two more horses went down and died, while a number of others showed symptoms of the same malady, but recovered. The steer and the first two horses died within twenty-four hours after showing the first symptoms, while the last two horses were sick three days before going down and lived twenty-four hours after going down. The symptoms in all cases were the same, similar to cerebro-spinal-meningitis.

"Now in the lot where these horses were turned during the day was an old straw pile, part of it three years old. The horses had been kept in this lot during the day all winter, were kept in the barn at night where they received plenty of good hay and, of course, ensilage.

"What in your opinion, was to blame for the deaths? Would ensilage affect horses so long after they have been away from it, or was the straw pile to blame? (It was rotten and mouldy). Or is it possible that the last that died had been affected five to six days without showing any marked symptoms?"

In a previous number of this journal I have given an account of silage poisoning. It seems to me that death in the first cases reported in the above letter by Dr. Schmidt was plainly caused by the mouldy silage. I do not think that this poisoning in the later cases could have been the same as silage poisoning. The old straw, of course, is mouldy and certainly an unfit food for horses and cattle. Do you think that these animals really ate some of this material?

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

Handling Army Horses for Export*

ALLOW me to make one apology before going into this topic, namely, the handling of army horses from a veterinary standpoint. I hardly think I am qualified to elaborate on the different angles of army horses from such a point of view. I will simply try to relate the way in which I have handled numbers of horses that have been bought in this country for the different Allies, more particularly those for the French, Italian and Swiss countries.

I will first relate the different ways in which these horses are purchased as this I think will be interesting, and will bring out more fully what is expected of a veterinarian in handling army horses.

First, the different countries supply a classification for the kind and numbers of horses they wish to purchase in this country. These contracts are usually obtained by men who are not in the horse business, but financial heads, and up until this time these contractors have been some of the bankers or large brokers of New York. They accept the contract merely from a financial standpoint, as it takes millions to fulfill a contract for ten, fifteen or twenty thousand horses. They usually sublet this contract to different horse commission houses throughout the different parts of the United States, putting a value at which these horses must be bought, differently at each location where the contract is sublet. The original contractors on all French contracts have certain conditions, of course, which they must meet. The most important are the following:

First: A definite number within a certain length of time.

Second: A specified number in transit.

Third: The original contractee must deliver all horses bought under original contracts, in France, five days after landing. By this, I mean, that all French horses purchased in this country have to be delivered in France five days before they are fully compensated for. From this one can get some idea of what the different veterinarians are trying to do for the contractors by whom they are employed.

Some contractors appoint veterinarians who are in charge of all purchases; that is to say, a veterinarian employed by the contractor first examines all horses that are submitted to the different French inspectors and veterinarians so that the contractor is satisfied that these horses are not sick or have been subjected to any of the many tricks, etc., employed by dealers to palm off unsound animals upon such contractors.

As the French captains and veterinarians who are here are appointed by the French government, they are most vitally interested in the horse simply from a standpoint of utility, sickness being left more or less to the contractor's part who makes the purchases. The contracts are usually let calling for a certain percentage of small or cavalry horses, and a certain percentage of heavy artillery horses. The French captains and veterinarians in this country seem to recognize four types, although they only buy three. They classify them as cavalry, light artillery, heavy artillery and heavy transports.

Immediately these horses are purchased, they are branded with a hot iron on the hoof in consecutive numbers, preceded by some initial, such as V or X, number so and so. They are also branded on the hip with different letters. These numbers and brands have a great significance both in this country and after they land in

* Paper read before the Chicago Veterinary Society, April 10, 1917.

France. Of the purchases from August of 1914, until the first of April, 1916, 1,075,000 horses have left this country for the different foreign Allies, each horse, as I have stated, being numbered and branded. Thus they can tell you for each animal the date of purchase, from whom he was purchased, what inspector passed him, and from what locality he came. The initials on the hip usually or always represent the contractor and the captain of the French army who passed them. The numbers on the hoof show different purchases from different points, and in the records, it would show when purchased, from whom he was purchased, and for what purpose. This is true of all the horses bought in this country, with the exception of those bought by Switzerland.

The Swiss horses are being purchased in this country simply to replenish their standing army, agreement having been reached by all foreign Allies' consent that they should replenish their army standard and keep to that standard at all times. They purchase in the neighborhood of 2,000 horses a year to keep it up to this normal standard. Their horses are simply branded on one hoof with a Maltese cross and on the other with a number, from which they also can determine the date of purchase, also from whom bought. The Swiss contracts in this country are all made by private purchases. They are buying this year only light and heavy cavalry horses.

In regard to the prices paid for these horses, they have fluctuated a little from time to time. The French government paid more for horses the first six months of the war than they are paying at the present time. I understand that they pay $278 per head landed in France, as stated before, for five days. I am informed that 60 per cent of the purchase price is advanced when the captain of the French government sends his report stating that so many were purchased and branded for their account on that day. The other 40 per cent is retained until the animals are landed in France. Their prices at the present time are $120 for cavalry horses, $160 for single A, or light artillery horses, and for the double A (AA), or heavy artillery horses, $165. The price paid for the heavy transport horse is the same price as the latter. The Swiss government pays for their riders, which are of very high standard, from $160 to $200.

After these horses have been passed by the French captain and veterinarian and accepted on the contractor's contract, they then come under the veterinarian's care or his responsibility. The following conditions usually take place as a rule:

They are shipped from the original point of purchase to some concentration camp, such as I have run for two different contractors since the war has started. They are shipped usually to the limit on time; that is to say, they are allowed to be in the cars right up to thirty-six hours, as it is an offense to leave them longer, and I want to state that they receive very little food or nourishment while they are in transit.

Immediately a trainload of horses comes into the Union Stock Yards or a concentration camp, the horses are put in pens which are thirty feet square and are bedded deeply with straw, the mangers being full of hay. They are allowed to eat as much as they desire for some two or three hours before being watered, and this is an all important point from a veterinary viewpoint, for if there is anything discouraging to the veterinarian, it is to have a trainload of horses come in and through some misunderstanding allowed to be watered immediately upon arrival. In such an event the veterinarian's services are in great demand, for he has then to treat colic, chills, and what not. One can readily understand the amount of water a horse will drink after having had none for thirty-six hours. I have even had horses come in during the summer time so fatigued and thirsty that to allow them to take a quart or two of water would mean death. Great care has to be exercised at this time, as I have stated, after their arrival. After the horses have stood for some two or three hours, the water is given to them gradually until their thirst is satisfied. They have hay at liberty.

After the horses are kept on this diet for twenty-four hours, they are placed the first day, for fifteen minutes on a ration of grain consisting of two-thirds oats and one-third corn, with a little bran in it. We allow them, after the first day, twenty minutes to this grain ration, and we figure that in this time a horse will consume six to eight pounds.

The horses are sorted under a veterinarian's direction every day. We employ a system of feeding here which is different from any place that I have seen in the United States. The grain ration which these horses are fed is given in a separate pen. We do this, feeling that we have accomplished three very important parts which go to make up the proper handling of army horses, namely, we feed the grain,

we exercise the horses, and every horse comes before the caretaker's eye each day. One of the important points for a veterinarian who is handling many army horses is the segregation of all sick animals immediately when they are found ailing, and this is a large task when one has from a few hundred to five or six thousand horses on hand at a time.

Each concentration camp is equipped with a hospital and facilities. We practice here in the yards the following methods in our hospital, and I wish to state that we have found them to work out quite well under most conditions:

A horse is brought from the concentration camp to the hospital. The veterinarian in charge immediately gives the horse an examination, prescribes for him and numbers him, and he is recorded on a chart. This chart states the date this horse came to the hospital, the medicine that was given, his temperatures night and morning, and the medicine he is given as an adjunct to the initial dosing. In this way, it matters not how many are treated or in the hospital, as each horse is treated, one might say, as an individual case. We have carried in our concentration camp here in the hospital department up to 1,388 head of horses. The hospital attendants are allotted a certain number of horses to care for. The doctors in charge are likewise allotted a number. All horses reaching our concentration camp are vaccinated with the United States Standard Serum Company's vaccine twelve hours after landing, if it is possible to give them this length of time.

The question will arise as to loss, and the percentage which are sick from the totals. With the experiences I have had it is hard to state just what percentage of the horses get sick, as there are a great many things that cause the differences in the percentage I might enumerate. I will simply state that for one man I have handled and kept in the concentration camp some 75,000 head of horses, with a total loss of 1.52 per cent. These horses average on feed about fifteen days at this concentration camp, from which they are shipped directly to the boats. The losses as a whole, talking with the different contractors, amount to between eight per cent and ten per cent. One bunch of horses may pass and land with a percentage of two or three per cent, while another one may run as high as 20 per cent, but on an average about eight per cent would about meet the conditions.

Chicago. T. C. TEIDEBOLD, M. D. C.

CASTRATING, WITH THE HORSE IN THE STANDING POSITION

After a six-year tryout I am a staunch advocate of castrating the male horse in the standing position. Although I have not yet castrated as many colts as some of the older veterinarians, I have castrated at least enough to learn that my methods must not be wrong, for out of over 1,200 phanerorchid colts castrated, I have yet to learn of my first fatality or sequela of serious nature, such as schirrous cords or broken limbs.

I do not castrate every colt in the standing position, for I find that is impossible or impracticable in some cases. Under the usual conditions I find that about ninety per cent of the colts can be castrated in the standing position. I do not attempt to castrate the colt in the standing position if his spermatic cords are real short, so that it is difficult to find the testicle; or, if on examining the scrotum I find there is a possibility of an inguinal rupture, the animal is cast. I usually cast the mule colt if it is young and small, for they are unhandy and treacherous to castrate while standing. By letting the mule colt go until it is two years old and halter broke, I usually can manage it. I have to take extra care in castrating the mule to avoid the later development of hydrocele.

Procedure—The colt is caught and a strong halter placed on it. Once in a while a wild colt will have to be snubbed to a post. I prefer to do the work out in a clean open place, such as a pasture. A twitch is placed on the colt's nose by someone who is not afraid of it or afraid to use his strength if necessary. I then approach the colt on the forward left side, and after gently petting the animal on the hip and flank, an examination is made for the testicles, and if everything is normal the scrotum and my hands are washed with an antiseptic solution. I find it handier and safer to do all of my work from the side of the colt. If one reaches around the hind leg with the right hand to make the incision, one is more apt to get hurt than in working from the side altogether. Taking the farthest testicle first, I make a good big incision with the hook-bladed castrating knife. I prefer that the angle formed by the hook blade be slightly obtuse. By using this blade I find that I am less apt to cut my left hand and am more apt to make a straight and complete incision exposing the testicle with one stroke of the knife.

The emasculator is placed as high on the cord as possible and care is taken that all the vessels and the cord are included. The

emasculator is quickly closed and the testicle jerked away. The left testicle is next removed in a similar manner. Frequently the colt tries to lie down while I am removing this testicle. In this case I instruct the man at the twitch to pull the colt towards me while a second assistant places his hand on the colt's left hip and supports him while I quickly emasculate the cord. I try not to draw down on the cord longer than is necessary, as this is what makes the colt want to lie down. I am sure that my emasculator is well closed before I take it off. The incisions are then enlarged, if necessary, by either tearing them open, using both hands, or with the use of a knife. Sometimes some of the dartos will hang down through the lips of the incisions. In this case, by the use of a vulcellum forceps and a knife or scissors, this is trimmed away.

I favor castrating the male horse in the standing position for the following reasons: First, I believe that one will more often perform an aseptic operation, for it can be done so quickly and there will be no dust or dirt falling into the wound, as is often the case when the colt is tied on the ground.

Second, it is so much easier on the animal. The suffering that a horse experiences in being tied down is often greater than that from the operation. I can't imagine a more uncalled-for torment than that of casting an old stallion for this operation when it is unnecessary. The animal will fight the ropes until he is wet with sweat when released, and is thus more apt to chill and will have less vitality to resist complications. Another big consideration in the matter of casting the animal is the danger of fracturing his neck or a limb, and even occasionally causing death outright.

A third reason for favoring the standing operation is the time and labor saved. During the castrating season I am usually very busy and any time I can save is worth the effort. Ordinarily one can castrate a bunch of colts in a fraction of the time it would take to cast them. In casting the colt the veterinarian usually has to do most of the work himself. The man has to be unusually strong who will not tire if he has very much of it to do.

A last, but by no means a less important reason, is that I favor this method in castrating because of the patronage it has brought me. In a Western state where I am located, a few years ago the veterinarian was seldom seen. The horse breeders had been doing their own castrating. The veterinarian was seldom asked to do castrating, unless the animal was a crpytorchid. When I introduced the standing operation to the farmers of this section it caught their eye. They wanted their colts castrated that way because they could see that it was so much easier on the colt. They were willing to pay a bigger fee than when colts were cast. They also recommended this method to their neighbors. My business in castrating has been multiplying rapidly, and more associations with the horsemen has brought me more work in other lines of the profession.

Weiser, Idaho. J. R. FULLER, D. V. M.

VETERINARY PRACTICE IN TROPICAL AMERICA

At the monthly meeting of the Chicago Veterinary Society, held at the Great Northern Hotel, May 8, the principal address of the evening was by Dr. N. S. Mayo of Chicago, the subject being "Veterinary Conditions in Tropical America."

Dr. Mayo said in part that a veterinary practice in tropical American countries and in all other countries, for that matter, depends upon various factors, among which may be mentioned, live stock, industry, topography, climate, customs and laws.

Tropical countries have some good live stock and are destined to have more. Dr. Mayo predicts that tropical America will become one of the greatest producers of the world's meat supply. He pointed out that medical science in overcoming the menace of tropical fevers had removed the barriers which have in the past prevented the development of tropical countries and confined the white man largely to the temperate zones.

Topography

Most tropical American countries are rough. Transportation is chiefly by horse back and ox cart. Live stock is reared practically under range conditions and that means that veterinarians must deal with them chiefly *en masse* and direct their efforts in the main to preventing epizootics, enzootics and parasitisms, rather than to treatment of the individual animal.

Climate Conditions

The climate of the tropical countries is favorable to the production of live stock. The region is well watered and stock is on pasture the year around. Expensive housing of the animals is not necessary. However, there are certain tropical diseases that must be reckoned with and the most important affecting the cattle industry is the cattle tick which causes severe losses, not so much because of the piroplasms of tick fever which it carries, as because of the abstraction of blood and the general debili-

tating effect from gross infestation. Moreover, the ticks produce injuries that become infested by screw worms which often cause death.

Customs and Laws

The custom of the people and their numerous and complicated laws, constitute one of the greatest difficulties to the American veterinarian attempting to establish himself in practice in a Spanish-American country. Many laws are not enforced except for selfish reasons.

Most of the veterinarians in tropical American countries are engaged in government service. Uruguay and Argentine maintain veterinary schools and there is one at Havana. Most of the students who enter these schools do so with the purpose of entering the government service. Colombia is attempting to establish a school and department of animal industry under the direction of American veterinarians, not only to improve live stock sanitary conditions in the country, but to meet the inspection requirements for the exportation of meat to the United States.

Colombia contains the best cattle of any of the tropical American countries. The animals are generally of light colors but they have no Jersey blood. They show strongly the East India type and are hardy and active. Venezuela has fair cattle and those of Honduras are also fair in quality. Such few veterinarians as do engage in general practice are located in the large cities. They have contract stables from which they draw a monthly allowance. They do very little surgery and make but very few calls. Pratically all of the actual work is done by the stable foreman under the direction of the veterinarian.

To illustrate the difficulty of obtaining a license to practice in Cuba, as a typical Latin-American country, and of the difficulties of maintaining the practice, Dr. Mayo related the experience of an American veterinarian who wished to register in Cuba. He had first to send his diploma to have it certified by a court of record in New York state where he had graduated. It was next sent to the Cuban consul at New York City, who certified that the court of records was such and entitled to certify to such papers. Then it was sent to the department of state of Havana, who certified that the Cuban consul of New York was entitled to certify to the fact that the court of records of New York was entitled to certify. From the department of state the diploma was sent to the department of education and finally to the University of Havana, where the doctor had to pass an examination in order to be legally registered.

The examination in this case was not severe, but there are comparatively few Americans who can pass it, unless they have a thorough knowledge of Spanish, as the examination must be given in that language.

This American veterinarian said he was going to give the people value received for their money and that he would render good and efficient service as far as lay in his power. He opened a hospital and conducted it along American lines. Soon he was in great demand for surgical work as few veterinarians in Havana do any surgery to speak of, but his success was short-lived. Some of the native veterinarians told the owners of stables that if they took any more cases to the American veterinarian they would report their stables to the sanitary department. There are many laws and regulations governing the maintenance of stables in the city that are rarely enforced. No one can live up to these regulations and to threaten a stable owner with a sanitary inspection was to put him out of business. The American veterinarian's practice fell off at once.

When a veterinary department was established in the University of Havana, Dr. Mayo was appointed one of the examiners for the faculty. Faculty positions in the University of Havana are life jobs and are filled by competitive examination. The salary is from $3,000 to $5,000 in gold a year. When time came for the examination there was only *one* applicant for each position. Each applicant was given twenty questions by the examining board, from which they selected one to answer. They were given twenty-four hours to prepare, and then were required to speak an hour on the subject. The examination was held in the formal faculty room in the University of Havana.

The candidate took his place in a small pulpit, made his salutation, looked at the clock and commenced to talk on the subject. If they talked the hour, they passed. When they came to the examination of professor of surgery, Dr. Mayo suggested that in addition to the oral examination, he be asked to perform some operation. This was revolutionary, but occuring during the American intervention, it was accepted as a splendid idea and Dr. Mayo was asked to suggest the operation. Dr. Mayo requested that he spay a bitch. The subject was selected and the operation scheduled for the afternoon. The examining board then adjourned for breakfast and that afternoon returned.

The applicant brought the bitch before them, evidently just recovering from the effects of chloroform anesthesia and exhibited an incision in the abdomen that had been sutured. The examining board pronounced it a splendid operation and the candidate passed.

Cattle are the principal work animals of

Cuba and other Latin-American countries, and the loads they pull are astonishing. A single yoke will often pull five tons of sugar cane on a two-wheel cart. The Cubans are very proud of nice animals and take pride in the ownership of them, yet they are exceedingly cruel and ride or drive horses about the streets so lame, galled or cut by spurs that they would be arrested for cruelty the minute they appeared on a street in the United States. The children show the same trait of cruelty to animals, a frequent amusement of boys being to tie a dog to a telegraph pole and stone it to death.

The horses in tropical American countries are small and used chiefly for riding. They are easy riding horses and will single-foot at the rate of five or six miles an hour for long distances. They are sturdy and of the broncho type, but have better dispositions. The Cubans sometimes break them to ride as yearlings. Full grown men whose feet almost touch the ground may be seen riding yearling colts.

Hogs are of two general types, the Chinese or hairless, and the native razor-back. The pigs of the razor-backs are frequently striped like tiger cats when young.

When Dr. Mayo went to Cuba he took Berkshires, splendid pure bred individuals of the approved type in this country; but the Cubans did not take to them. They said that the sows would not fight off the wild dogs and thus the pigs would be eaten up. The hogs live chiefly in the woods in which are many wild dogs, the descendants of the dogs formerly kept to hunt slaves. These wild dogs prey upon young pigs. The native razor-backs go in bunches and when attacked by dogs, the pigs run to the center and the older ones surround them and put up a fight that in most instances defeats the dogs.

Later Dr. Mayo took some Tamworths to Cuba. These Tamworths when crossed with the native razor-backs made an animal that not only could fight off the wild dogs, but they were liable to tree the native Cuban on sight. Cuban hogs live, to a considerable extent, on wild fruits and on the nuts of royal palms that grow everywhere in the island.

There are but few sheep in Cuba or in Central America, and such as there are, are mostly of the woolless type. There are many goats. The goats are used largely for milk. Children often suckle the goats. Asses' milk is in much demand for children and invalids, and a lactating ass will rent from $25.00 to $35.00 a month in gold for its milk.

Mare's milk is also highly prized and it was pitiful to see poor women bring their sick babies in numbers to the experiment station to beg mare's milk. The colts were frequently robbed to supply these sick babies with mare's milk. Cuban mothers have much faith in the curative power of mare's milk. The milk cows were few in number and poor in quality. The milk that is marketed in the city was frequently adulterated. On account of this, cows are commonly driven through the streets and milked before the customer. Goats are likewise driven through the streets and milked on demand.

The country roads in Cuba are usually very bad, except the national roads. These are splendid macadamized roads, reaching various parts of the island. They were built for military purposes. The horses traveling on these roads are subject to laminitis. The roads other than these national roads are centuries old, and have been worn to deep ditches by the great two-wheel ox carts. In the rainy season they are filled with mud, the mud holes often reaching the depth of three or four feet. No one ever thinks of repairing a road or doing anything to fix it up. Dr. Mayo mentioned one mud hole very near the experiment station in which he was located. This was the only mud hole within a stretch of several miles. This hole was several feet deep, and from one to half a dozen carts were stuck in this hole every day throughout the rainy season, yet no one ever thought of fixing it, and probably it exists today just as it has for a hundred years.

Nearly all of the stock in Cuba is registered and no one can sell an animal except by producing a certificate of registration. If animals are driven along the public highway, the rural guards that are found everywhere, stop them and demand a certificate of ownership. If the man in charge cannot show such a certificate of ownership, he is adjudged to have stolen the animals, and such judgment is usually well founded. If an animal is not registered and is lost or stolen, the owner has no redress.

The animals in Cuba are subject to the ordinary injuries incident to agriculture and commerce. But the injuries are more severe owing to the prevalence of the screw worm and flies. The animals seldom if ever have any hay, but feed on green stuff. Digestive troubles are frequent and tetanus is very common. Summer sores are a serious ailment. There is also a type of dermatitis not seen in this country that affects horses on wet pastures at the coronet, and a necrotic ulceration of the angle of the mouth that may extend until the molars are exposed and the feed falls out when the animal eats. It is the custom of the countryman when riding into town, to ride directly into the stores and sit upon his horse and barter. In front of the stores feed boxes are arranged, and the horses are fed while the rider bargains. These feed

boxes are frequently a means of communicating glanders from one animal to another.

Cattle Diseases

Ticks already mentioned deserve first consideration. Anthrax and black leg are frequent. Infectious diarrhea, much like white scours, affects calves and yearlings. Liver flukes are common and cause considerable loss, particularly in the dry season.

Poultry Diseases

Poultry is very high in Cuba, and it is a common thing for northern people to undertake to make their fortune in Cuba by raising poultry. Eggs sell for about 5c each the year round. The egg dealer has a board with holes bored in it, in which broken eggs in the half shell are kept and he will sell either the yolk or the white of the egg for 3c. One can see women in the market picking up half eggs to see which is the heaviest to decide upon which they will take.

The diseases of poultry are such as to greatly handicap the industry. Diarrheal diseases are exceedingly common; gapes and other parasitic diseases are veritable plagues. The chickens are almost all of the game type.

Habits of the People

The people are very superstitious. Many of them cannot read or write. They have a wholesome regard for American sanitary officers. During the first American intervention the army cleaned up the island with a vengeance and the countrymen yet remember more than all else the American sanitary officers.

The Cuban countrymen are exceedingly hospitable and courteous. They will divide their last meal or their last bite with any stranger who comes to their door. During the early part of Dr. Mayo's tenure in Cuba, Jose Palma, a son of the president frequently accompanied him as guide and interpreter. It is a custom when departing from a homestead for the host to say, "My house and my servants and all that I have are yours," and it is the custom for the visitor to respond, "At such and such a place, (naming his home), you have a home and a friend at your command."

Jose Palma never announced himself as the President's son until the time came for his leave-taking, and then he would respond to his host, "At the President's palace in Havana you have a house and a friend." This always astounded the poor countryman who, at the thought that he had entertained such a distinguished guest and had not shown him the courtesy that perhaps such a one was entitled to, could only exclaim in confusion, "Holy Virgin Mary."

D. M. C.

UTERINE TORSION AND PERITONEAL ADHESIONS

One evening, in reply to a call, I saw a laboring cow that had been "straining," as the owner said, since morning. The owner had attempted to deliver the calf, but being unable to reach the fetus, he necessarily failed to accomplish his purpose.

Upon examination, I found the vulva and vagina normal, but the os uteri was almost closed. But by careful manipulation I was able to pass my hand into the uterine cavity. However, in doing so, I thought that there existed some torsion of the tuerus. By working with both hands to good advantage, I finally dilated the os enough so that I could work comfortably. Then I managed to attach a cord to one of the calf's fore legs. Next by means of force directed against the body of the fetus, I attempted to straighten the twist of the uterus but failed. Consequently, I raised the cow's hind parts with blocks and rope, and the uterus was made to assume a position that was more nearly normal than could be effected when the animal was recumbent.

This made it possible to attach a cord to the other front leg, and both legs were drawn through the cervix and into the vaginal canal. As a result of these mutations and manipulations, the cervix was slowly dilating, and I was enabled to secure a hold upon the head of the fetus by means of a blunt hook inserted into the orbital cavity. By means of traction upon the three extremities, which I steadily and carefully continued for nearly an hour, the cervix of the uterus dilated sufficiently to permit passage of the fetus. A three-inch rent near the superior commissure of the vulva occurred despite great care exercised to prevent it.

The calf lived only about twenty minutes. The placental membranes were removed without difficulty, and then the vulvar injury was cleansed and the wound sutured. I gave the cow nux vomica and aromatic spirits of ammonia. She died thirty-six hours after having been delivered of the calf.

At the autopsy, I found adhesions about two inches in width and about six or eight inches in length between portions of the left horn and body of the uterus and the left dorsolateral parietal peritoneum. This adhesion was quite firm and prevented complete correction of the torsion. My client said that about two months prior to labor the cow began "making bag" and that this with relaxation of the external genitals progressed for about ten days. These premature signs of advanced pregnancy did not progress thereafter.

I should appreciate suggestions from veterinarians that might be helpful. For instance,

how should I have handled the case so that results might have been otherwise?

Sloan, Ia. E. V. STROMLUND, D. V. S.

RABIES WITH APPARENTLY LONG PERIODS OF INCUBATION

On September 11, 1914, I was called to the country by a client to see a dog that, as he said, was acting very strangely. The dog was a young female of mixed breed that had raised one litter of puppies. Inquiry into the history of this case revealed the fact that this dog had been very irritable and active for several days; she had been chasing chickens, hogs and horses in an unusual and indiscriminate manner; she had bitten several hogs and five horses and these five horses all had wounds on their hind legs near the feet.

In the owner's attempt to whip the dog for her misbehavior, he was bitten in the calf of his left leg; his trousers were torn and a skin wound of a little more than an inch in length was inflicted.

I told the owner that I suspected rabies and ordered the dog tied in a closed place where she could be watched. On leaving the place I told the owner to inform me of any marked changes that might occur and explained to him some of the symptoms that might develop.

On September 13th, two days later, I was called; a decided change in the dog's appearance and attitude was evident. I found the animal very nervous and almost unable to stand. The dog had a hoarse bark and the lower jaw was dropped in a characteristic manner. I informed the owner that it was my opinion that the dog had rabies but that I felt it necessary to have my diagnosis confirmed by microscopic examination of the animal's brain. The dog's head was severed from the body, packed in ice and the owner was instructed to take it to Dr. A. T Kinsley at Kansas City where, if a positive diagnosis of rabies was made microscopically, my client might be in a position to begin taking the Pasteur treatment. I then killed all other dogs on the farm and had their carcasses destroyed. They were not considered valuable in any way, hence no treatment was attempted. My diagnosis was confirmed by the laboratory findings and the owner of the dog took the Pasteur treatment and experienced no bad effects.

On October 21, 1914, one of the horses that had been bitten by the rabid dog developed rabies and died. On November 26, 1914, another of these horses developed rabies and also died. No further trouble developed until June 18, 1915, at which time another of the animals that had been bitten, developed rabies. This was a young mare that was suckling a young colt. She soon became very furious, biting at everything within reach. After she had torn the skin and flesh of her own body, especially that of the fore legs, and had worn away about one-half of the upper incisor teeth on a concrete floor, she was destroyed. The colt also was destroyed at the same time. A short time after the death of the mare and colt, one of the other horses that had been bitten died from pneumonia. The surviving horse remained healthy for eighteen months, when it was sold and shipped out of the country.

This happened in a community where outbreaks of rabies are almost unheard of, where when rabies has occurred no great number of animals have ever been affected. Was the case which developed on June 15, 1915, or almost nine months after known exposure, an instance wherein manifestation of the disease was tardy?

G. F. JUNGERMAN, D. V. S.

Hiawatha, Kans.

EQUINE PNEUMONIA AND DISTEMPER

I have treated more pneumonia cases in horses within the last month (January) than I have treated for ten years before. There is an unprecedented demand here for coal, and the farmers for miles around are hauling coal to the railroad and shipping it. At the Western Maryland freight yards, there were six fifty-ton capacity coal cars loaded in one day, and every pound of it was hauled in on wagons, loaded and unloaded by hand. In this work all kinds of horses are employed, and as they suffer exposure due to inclement weather and bad roads, they are rendered liable to disease, and we are having a form of pulmonary equine influenza or infectious pneumonia of the horse. Two of my patients died due to delayed treatment, one of them living about two hours after I saw it. The other lived a few days.

I have not used serum or vaccine treatment during this outbreak as my patients all get along nicely without it, and perhaps would not fare any better with it. I have a treatment of my own that has given me better results than anything I have every used. Following is the formula:

Creosote, pure beechwood	2 ounces
Oil Eucalyptus	4 ounces
Gum camphor	8 ounces
Alcohol, qs. a.d.	1 pint

Of this mixture I usually take two ounces and two drams powdered acacia and water to make a pint. I usually incorporate an ounce of fluid extract of nux vomica and any other drug that may be indicated. Of this mixture two tablespoonfuls are given in a little water every three or four hours. In bad cases a few double doses are given. When the cough

is troublesome, an ounce or two of fluid extract of stramonium is included in the above mixture. The above dose contains approximately seven and one-half drops of creosote, from fifteen to twenty drops of oil of Eucalyptus and thirty grains camphor.

In addition to the above, I sometimes give the following mixture three or four times daily, and in ordinary distemper cases, I have this powder given every three hours:

Powdered potassium nitrate	2 pounds
Powdered ammonia muriate	3 pounds
Magnesium sulphate	8 pounds
Powdered ginger	1 pound
Powdered capsicum	½ pound

Take one pound of this mixture, add a few tablespoonfuls of flour and add syrup to make a thick paste. Of this mixture give two heaping tablespoonfuls three times daily or oftener if necessary by wiping on tongue with a long wooden paddle.

Myersdale, Pa. R. M. BEACHY.

EVERSION OF THE UTERUS

This condition is often met in the course of one's experience in general practice in the spring of the year, and the cow and the mare are frequently affected. These cases quite frequently constitute very perplexing problems. Especially is this so when we find the subject down, unable or unwilling to rise, and the everted uterus a mass of blood, straw and filth, and this condition to be handled without available assistance. In handling these cases unassisted, about the time one has the uterus cleansed and ready for replacement, the subject then struggles and thoroughly contaminates the parts, and the work of cleansing has to be done over again.

In handling this condition, I have tried various agents such as chloral hydrate and morphin to quiet the animal and belladonna and ergot to control hemorrhage. I have also tried bandaging the mass to reduce its size, but all of this has not been satisfactory.

For several years I have made use of the block and tackle when the subject was down, elevating its hind parts as one does in difficult parturition. This has proved much more satisfactory than other methods that I have employed. After having elevated the hind parts, the uterus is thoroughly cleansed, and before final washing, a clean sheet of muslin or other material is used to protect the parts so that they will not become soiled. The uterus is then replaced by using firm continued pressure against its fundus. When the animal is in the aforementioned position, straining and other resistance is reduced to the minimum.

After the parts have been replaced, two or three pails of an antiseptic solution are pumped into the uterus while the animal is still supported by the ropes. This solution serves the purpose of replacing the parts in their normal position, thoroughly replacing every fold of the mucous membranes. After the solution has been retained a few minutes ,the animal is let down and the solution is spontaneously evacuated.

I consider this the most successful method I have ever tried for replacing the uterus when an animal is down.

Pochahontas, Iowa. W. A. MOELLER.

Comment: It would be interesting to know whether Dr. Moeller employs the method of elevating the parturient animal's hind quarters in the equine subject. Cows offer practically no resistance to being placed in this position, and after they have been elevated submit calmly to the ordeal. Some veterinarians employ this method in handling dystocia in the mare, but in the opinions of many, the practicability of this means of restraint in laboring mares is a debatable question and one wherein the experiences of practicing veterinarians would be instructive. We solicit opinions on this subject and hope that we may hear from many veterinarians.

On page 833 of Williams' "Veterinary Obstetrics," he says: "It should be constantly borne in mind by the obstetrist that the position of the organ [uterus], as related to the body of the patient, affects its size, and that, if the organ can be held somewhat above the level of the vulva, or at least as high as that organ, the blood tends to pass back into the body, thus relieving to an appreciable degree the engorgement of the organ, and rendering its replacement more practicable."

Veterinarians who have had extensive experience in obstetrical work in the large animals all recognize the difficulty that is experienced in replacing an everted uterus when an animal is in the standing position. In the cow if facilities for elevating the hind parts are at hand, no other means of restraint should be attempted. In the mare when down (and they are up and down frequenlty when the uterus is everted), the subject should be hogtied, so as to be confined in a laterocumbent position, and if the veterinarian is not practicing elevation of the hind parts, the everted uterus may be supported upon an improvised table that can be covered with an oil cloth so that during the process of cleansing, marked reduction in the size of the congested organ will occur because of its elevated position.

Straining and other efforts on the part of the subject that render reposition more difficult, may be largely checked by the judicious use of a twitch. Eversion of the uterus in the mare is, however, a very serious affection, one that always causes considerable shock, and if early attention is not given to subjects that are affected in this manner, a fatal issue is quite likely to result.—Eds.

POSTASSIUM PERMANGANATE IN TREATING PERITONITIS

About six months ago, I was called to see a sick mare. On arriving at the farm and examining the animal, which I found had been suffering with influenza for several weeks, I was informed that she had aborted. On closer examination, I diagnosed a case of peritonitis as a complication of influenza and told the owner that the case was very grave and that the animal would probably die.

He being a man with limited means who could not very well afford to lose the animal, said, "Can't you do anything for her, Doc.? I just can't afford to lose her." Naturally I was touched by the man's appeal, so I said, "In my experience as a practitioner of veterinary medicine, these cases are invariably lost in spite of numberless different treatments which have been employed, but I am still willing to try and will do all that I can for you."

I dissolved a fifteen-grain tablet of potassium permanganate in a quart of warm water and gave it in a drench. I followed this with three other like doses the same day. The next day I gave thirty grains in six doses, and the next, fifteen grains and so on. The fever being high in this case, I also gave veratrum and bryonia.

Forty-eight hours after treatment was begun, the animal quit showing pains. The treatment was continued for a week, and the patient recovered with the exception that the permanganate affected the kidneys like an irritant producing nephritis. Thick, dark urine was voided in small amounts. The hind legs were stiff and there was an edematous condition of the lower extremities. For this, I gave non-irritating diuretics. Fluid extract of cornsilk and green fluid extract of thlaspi bursa pastoris (shepherd's purse) are good drugs to use.

The case in hand showed all the characteristic symptoms of peritonitis such as pawing, high fever, quick, wiry pulse, tenderness in the flanks, temporary subsidence of pain on rising or when the animal lay stretched out. Groaning, suppressed bowel sounds, tympany, etc., were also present.

Since caring for this case, I have treated successfully, five other cases of peritonitis and half a dozen cases of inflammation of the bowels. I have abandoned the administration of permanganate of potash by the mouth except in cases associated with tympany, where I give several doses to control the gaseous accumulation. I now give potassium permanganate in one-fourth per cent solution directly into the jugular vein and use from 40 to 60 c. c. daily until all inflammatory symptoms have disappeared. This is not only a more desirable way of administering the drug, but it also gives quicker results.

Let me emphasize that the drug irritates the kidneys, and one should always administer a large dose of some non-irritating diuretic with each dose of potassium permanganate. So far my results have been 100 per cent perfect in peritonitis of Equidæ. I should like to have readers try this treatment whenever a chance is offered and report results from individual cases. I only ask that they be sure of their diagnosis before applying the treatment.

I do not recommend administration by the mouth because it is too slow and uncertain. With proper precautions, no bad results will follow intravenous injection. It is surely a result getter. I have abolished pain in twelve to fifteen hours and quit treatment after thirty-six hours in several cases. All cases, however, will not do this.

Mt. Sterling, Iowa. C. F. Neis.

HELPFUL SUGGESTIONS

1. Actinomycosis was very prevalent in Ontario, where I practiced, some farmers having as high as eight and ten cases at one time. I tried dissecting them out, the application of liniment and caustics locally, and the injections of tincture of iodin, etc., and often there remained quite a large lump which dissatisfied my clients. Finally I tried to slough the enlargement with caustics. I found that the use of zinc chlorid, in powder form, acted nicely. To do this I opened the tumors at their upper portions and forced the yellowish-white pus from the cavity. Then I inserted the zinc chlorid (one to two drams), according to the size of the enlargement. The lips of the wound and tumor were sutured as lightly as possible to retain the zinc chlorid until its action was spent. Usually in ten to fifteen days' time the enlargement sloughed out or became sequestrated and was pulled out, and no other treatment was necessary. I kept a record of all my cases treated, which numbered over three hundred in four years' time. A few of these animals were diseased in the face and most of the bony affections attacked the inferior maxilla bone; and these, for me, were incurable. No other treatment seemed necessary.

2. Try plaster paris applied wet with a compress surrounding the neck to a case where the tissues and jugular vein have sloughed so much that the blood spurts out freely when the animal is eating. Also tie the head up and feed high.

3. Try a rubber patch applied both inside and outside of the cheek and retained there by a few large sutures through the cheek, after a case of open wound of the cheek. (I had a case where a broncho's cheek sloughed badly, caused by impacted food.)

4. Try to suspend the head of a horse after tying up on the neck, resulting in a twist or

wry neck,—insert a bag between the cheek and the halter above the nose band, pass it around behind the jaws, and bring it forward inside the opposite check strap and above the nose band, now join the other end to this first end, secure a rope and tie the head up part way and repeat every other day until a normal height is assumed. This method does not make the head sore and does the trick.

5. Try the following plan to dispatch horses. Shoot them in the supra-orbital fossa. Aim before taking a position so that the bullet passes backward and death is instantaneous. Some time ago there were many opinions expressed. This method is reliable and especially good in a country practice.

6. Try rubber bumpers secured to your operating halter. You can use the rubber from a wringing machine. These are sawed in two, using one half to each side and attached by passing a strap through and riveting it above and below to the halter rings. I find this to be a great protection to the eyes and head of a patient suffering pain while down with colic azoturia, etc.

Gironi, Sask. WILLET TANNER.

PARTURIENT PARESIS WITH COMPLICATIONS

The morning of the 18th of March, I was called to see a cow said to have milk fever and found the following condition:

A grade Shorthorn cow in good condition delivered of its fourth calf at five p. m., March 17, was milked and gave fully three gallons of milk. Next morning at 7 a. m. she was found to have just passed the placenta but had no milk and was staggering. She soon fell and started to throw herself about, even breaking down a partition, and got in such a position that the owner was obliged to send for help to get her out and in a comfortable place.

Attempt to treat her with salts was given up as she would not (could not) take any of it. (This owner is a genteel man; one of the other kind might have made her swallow.) I was then sent for, but having to break the road through snow, for five miles, I did not arrive until 10:30. I at once administered the air treatment and propped the cow up on her breast. She gave evidence of more suffering than I have ever seen in any other animal, tossing her head and, at times pulling it back as far as possible, but not keeping it in any certain position for more than a minute or two, continually groaning, at times burying her foaming muzzle in the straw. Her eyes were bright in contrast to the usual appearance in parturient paresis, respiration rapid (I did not note rate), pulse imperceptible, skin clammy and hot, reminding one of a horse with azoturia, but for all that the temperature was only 101.4.

After having observed these phenomena and taken a little time for reflecting, the word "eclampsia" came to my mind, for as I thought there surely had been no time for a case of cerebral inflammation to develop, and I forthwith administered one-twentieth of one grain lobelin sulphate hypodermically and awaited results. The effect soon was noticed in that the cow became more quiet and the respiratory movements less rapid, although dyspnea was very much in evidence. Loud rales and at times snoring accompanied respiration. I now began to hope for recovery, even though I had not been able to get any pulse, but it seems to me, this often happens with cattle.

At 12 noon I administered one-quarter grain atropin. At 1:30 p. m., the cow died and no apparent changes had been noticed during these three hours, except as noted regarding cessation of the violent suffering and improvement in the respiration.

Steffen claims that these cases make the quickest recovery, providing no strychnin sulphate and only air treatment and atropin is used. Danish authors, however, are more skeptical and do not give much encouragement. Ice bags to head and venesection is advised.

Discussion and criticism on the above is invited.

Tyler, Minn. H. RASMUSSEN, D. V. M.

Commentary: In a few instances symptoms such as are described by Dr. Rasmussen have been observed by the writer. These cases are the so-called eclampsias that are described by numerous writers on this phase of practice. In our experience such cases are without exception critical and the majority treated have been lost. We have also noticed that cows so affected may suddenly succumb when an ordinary dose of strychnin is administered subcutaneously. In one case, however, recovery followed inflation of the udder with oxygen, repeated irrigation of the uterus with large quantities of antiseptic solutions and the administration of atropin.—Eds.

ADVOCATES CARING FOR INDIGENT VETERINARIANS

In perusing the March number of the JOURNAL, one article appealed to me particularly, and that was Dr. Hollingsworth's "Should the Veterinary Profession Care for Its Indigent Members?" My answer is most emphatically that they should. The reasons are evident to any one and need not be dwelt upon, particularly in the crisis that exists at the present time in diplomatic affairs. It would be one step toward preparedness for which we are clamoring.

The method by which such a fund or bureau could be established, in which our whole country could be embraced, would necessarily

be, in my opinion, through the A. V. M. A. This could be done by a small assessment to each member, which I do not think any one would object to, or by laying aside a certain fund from the general treasury.

This is a debt which we owe to each other, and whatever method may be resorted to for this purpose, I sincerely hope that others may take this up and start something.

JOSEPH M. ARBÚRUA, D. V. M.
Hanford, Cal.

UMBILICAL HERNIA

Umbilical hernia in colts should not be considered as a surgical condition before the sixth month. This form of rupture is amenable to medical treatment in probably 90 per cent of all cases if treatment is begun not later than the second month of life.

An umbilical hernia that gives no evidence of becoming reduced, or on the other hand, that increases in size by the time the colt is two months old, should be treated. Umbilical hernia that decreases in size can be left alone until the colt nears the age of six months. Many cases of navel hernia disappear spontaneously before the sixth month. In all cases a cure should be attempted by medicinal agents before surgical intervention is thought of. The risk with medical treatment is practically nil, and if the result should not be completely satisfactory the colt is still a good subject for the surgical procedure. I repeat that, if treatment is begun not later than at two months of age, a cure results in 90 per cent of all cases. About one in ten will refuse to yield to such measures as I am about to outline, and appropriate surgical interference will be required for the correction of the abnormality in these.

Treatment. Very small hernias will disappear with the use of ordinary blisters. The treatment that I have found the most cleanly, and that accomplishes uniformly satisfactory results with reasonable dispatch, consists of the application of fuming nitric acid. To make the application properly the colt must be laid on his back. Before the acid is applied a good sized area around the hernia enlargement, which area should not get nearer than one inch to the outer circumference of the enlargement, is liberally smeared with vaseline. Lard should not be used; it is too light in body and does not remain adherent long enough.

The acid is then painted with moderate generosity over the enlargement itself. The colt is allowed to arise immediately. There is now and then a colt that will give slight evidence of pain from the application, but this is rare.

Within a day there appears a diffuse swelling in and around the hernial enlargement. This remains for variable periods of time, usually a few weeks, and when it disappears it is noted that the hernia is also gone. There is usually a necrotic area in the skin where the acid has been applied. This area requires no attention, and as the location is always in a place where it can not be noticed, the slight scar that remains is no reason for objection to the treatment.

One application is all that is required. Cases that do not yield to this application will not yield to any other form of medicinal treatment that I know of. This treatment is especially to be remembered because of its

1. Ease of application.
2. Practicability.
3. Safety.
4. Regularity of cure.

Hernias that have not entirely disappeared when the swelling caused by the nitric acid is gone, should not be turned over to the surgeon with too much haste. Some that at first apparently have not been cured will yet slowly reduce in size during the following weeks. If then, at the end of another two weeks no improvement is evident, surgical measures are in order.

Such cases that still show some degree of hernia when the swelling from the acid treatment has disappeared will, if examined, be found to contain in the bottom of the hernial sac a hardened disk of consolidated effusion. This should not be disturbed by manipulation, as on its endurance depends the beneficial action that may yet ensue.

If no improvement has resulted when this disk has been entirely absorbed, none is to be expected later.

Potter, Wis. MART R. STEFFEN, V. S., M. D. C.

[Comments:—In the foregoing article the writer should distinguish between enterocele and epiplocele when he makes the statement that, "many cases of umbilical hernia disappear spontaneously before the sixth month." Few, if any cases of enterocele disappear spontaneously. It is only where the hernial opening is very small that recovery is spontaneous—only in the omental hernias.—Eds.]

CONCERNING UTERINE IRRIGATION

I wish to ask, does T. S. (Spencer) mean to say "experience has taught me" that we must not flush out the uterus of cows after removing the afterbirth for fear of killing some of them, and H. Frederick in January JOURNAL and H. Theobald in the March JOURNAL mean only the uterus may be flushed? I have never found that there came to my

patient any trouble in flushing the whole organ, and these latter named gentlemen may so mean. If there is a rupture in any place and we attempt to flush the organ, it would be certain death and our patient is destined for the bone yard anyway.

Dr. Dadd taught us that we could use quite an amount of sterilized water and not too strongly saturated with potassium permanganate without any danger and I have followed his instructions for many years on many cases, and had no ill effects where there was no rupture.

Salem, Ore. D. D. KEELER, D. V. M.

DENTAL SURGERY

Veterinary Dental Surgery is the one branch of veterinary science that has profited more and also caused more loss than any other that I can think of. The main reason that this particular branch of our work has cost us so dearly is due to the fact that so many who practice have commercialized it and have entirely forgotten the scientific and practical side of the work. I have in mind the operator who examines his patients in the street or any other unsuitable location by grasping its tongue and causing the animal to open its mouth. He then takes a look leading the audience to believe that he has seen all there is to be seen and if any one should mention an instrument for the purpose of opening the mouth he quickly tells them that a good man does not need such an instrument and that he would not own one on a bet. Such a man, if he is a non-licensed practitioner, should be stopped; and if he does hold a license, he should be regarded as a menace to the profession. There are practioners of this sort, both licensed and non-licensed, in almost every community.

One cannot properly examine the teeth of a horse unless the animal is placed in a suitable location where there is plenty of light, and then by palpation, observation and with a keen sense of smell and the aid of a good speculum, it is possible to locate conditions that demand treatment other than simple filing. But with many dentists today, there seems to be a great tendency to display skill in handling a patient, but not enough towards thoroughness in the work. Several years ago the majority of our patients for dental work were brought to us because they did not rein properly, or for some other annoyance caused by the movements of the animals' heads. Many of these patients could be relieved by simple filing of the teeth. Today the majority of the average practitioner's dental patients are brought to him because of the unthrifty condition of the animals. Most of these cannot be remedied by dental work. The reason for this change is the passing of the light driving horse. Regardless of these changes, filing the molars is as popular as ever, with many veterinarians.

Another disgusting phase of dental surgery as practiced today is the examining of a number of horses and filing the teeth of all of them whether needed or not. A man would never think of going to a dentist and demanding that work be done whether it was needed or not, yet everyone needs a thorough examination of his teeth once a year at least and so does every horse. But they do not all need dental work. If a horse's mouth and teeth are found in a normal condition, why should not the surgeon state this fact to his client and charge him for the examination as he would for any other service rendered? It is due to just such practice that the veterinarians are losing fees that would amount to hundreds of dollars and their clients thousands of dollars because of work that is being discouraged by such unscrupulous work. Unfortunately, however, there are many practitioners whose motto is, "Get the money." Getting a dollar today that will cost ten tomorrow and at the same time lower our professional standards is calculated to put us on the same plane with the unscrupulous empiric whom we are trying to legislate out of business. In this connection it might be mentioned that the empiric cannot be legislated out of business while qualified (?) men practice his methods.

Many horse owners realize the amount of graft that exists in connection with dental work as it is done by some and will not allow their horses' teeth to be examined; consequently, many animals that need dental work must suffer as a result.

Veterinary dentistry as it has been generally practiced has afforded a starting point for more empirics than any other branch of our work. Tooth filing is one operation that has most appealed to empirics.

One of the main reasons that this unfortunate state of affairs regarding veterinary dental surgery exists today is that some of our veterinary colleges have made no great effort to improve the condition. It is a practice of some schools to take a number of students to large stables where dental work is done under contract and start them at filing teeth, placing great stress upon the manner in which the float is to be handled and not devoting sufficient time to instruction and demonstration pertinent to thoroughness in examinations for the establishment of diagnosis.

Unless some concerted effort is made to remove these unfortunate methods of practice, that seem to be so deeply rooted, veterinary dental surgery has little chance of gaining the recognition that it deserves.

Alpena, Mich. A. A. MOTLEY, D. V. S.

"FORDING" FROM DETROIT TO SOUTHERN KANSAS

Being run down in health and fearing a break down after the long illness and death of my wife, who had recently passed away, I felt the very best thing I could do was to get away from Cedar Vale for some few weeks, and knowing that a delightful journey could be had by touching a few of the bigger cities, I, or rather we, planned our trip by rail. My companion was Mr. J. H. Thompson, a young lumberman of this city, who was getting restless in Kansas and wanted to see more of these United States. He was a good natured, affable and pleasant companion and our trip was a most enjoyable one.

We stopped first at Kansas City, but as we were both well acquainted with the city, there was not much new for us to see and we soon proceeded to Chicago. We certainly could have spent many more days in Chicago than we had to spare. We visited the wonderful parks, wonderful because of the zoo in Lincoln park, the conservatory in Garfield park, the site of the World's Fair in Jackson park, and other points of interest, which even to enumerate would take up too much time and space. We also visited the stock yards, and as we had just seen the Kansas City outfit, we were pleasantly surprised at their immensity and to note the way the larger stock houses systematically receive and dispose of thousands and thousands of head of cattle, sheep and hogs every day. In Chicago we also visited the laboratories of some of the well known supply houses and I availed myself of the opportunity, while in the city, to meet several practitioners whom I had not met for several years.

Leaving Chicago, we journeyed to Cleveland, the slogan of which, as you know, is the "beautiful city." It lives up to its name in every detail. The high hills and the grand estates and the cooling breezes from Lake Erie tend to hold one's rapt attention. We next visited Buffalo, and while I could go into the same details about the beauties of this city as I have of Chicago, it is not necessary for anyone who has been there knows that Buffalo is one of the places that it is worth any man's time to visit. This also must be said of Niagara Falls visited by nearly every Old World visitor to America, and a point of continual interest to the citizens of the United States.

After a short journey through the southern part of Canada, we left for Detroit. It was our intention to reach there and go on the boat trip with the A. V. M. A. party that Parke-Davis were entertaining, but we did not reach there until after the boat had started; just in time to appreciate what Parke-Davis was doing, but a little too late to partake of their hospitality.

The thought of getting an automobile had not entered my head, but after visiting several of the larger automobile factories in Detroit, we decided that nothing could be better than to purchase a machine and make the return trip in it. I thought for some time about the machine that would answer my purpose best in Cedar Vale, and finally decided on a Ford.

With this small machine and with no equipment other than that regularly furnished by the Ford factory, and with only our two suitcases, containing our wearing apparel, etc., we left Detroit. This was during the latter part of August. It was nothing else than a desire for adventure and to avail ourselves of the opportunity to see more of the country that prompted us to make the return trip in the car.

I had never driven a car and the first day out we proceeded cautiously as you may well believe, but as it doesn't take much training to master the running of a Ford car, I soon considered myself an old timer at the wheel. We drove seventy-three miles the first day and stopped at Toledo, Ohio, and putting up at a hotel, we proceeded to enjoy the evening in Toledo.

We had no trouble at all with the machine, not even a puncture that first day nor at any time during the trip. Since returning, I have talked with several motor enthusiasts, who have taken long trips and each and every one has said that we were unusually fortunate in not having any mechanical or tire troubles on a journey such as we took. The main reason, I think, that we were spared these annoyances, was the fact that it was nearly all straight driving. We encountered the hills of Ohio and Indiana, but that did not give us any trouble and we took the hills easily. Another factor in our seemingly unusual luck, was the fact that there were just two of us in the car, and we carried practically no baggage. We had no tent or camp equipment, as we early decided that it would be unnecessary to invest in a tent, inasmuch as our route was arranged so that we would stop at good sized cities, where we were sure of adequate hotel accommodations.

We left Toledo bright and early the morning after our arrival and stopped in succession at Fort Wayne, Indianapolis, and Terre Haute in the Hoosier state. We passed through many small villages and towns and had our big noon day meal in the closest farm house. We had both been through the New England states and fully appreciated what I refer to as Yankee hospitality, and now I feel certain that the citizens of Indiana were of Yankee origin,

as they could not have treated us better if we were invited guests.

Leaving Terre Haute, we skirted the boundary line of Indiana, appreciating all the way the wonderful scenery and enjoying the country with its late harvest and flowers, which are at the height of their natural beauty in the late summer and early fall.

We stopped at St. Louis two days, driving about the city, for by that time I felt that I could direct the car along any country road or any city street, but in St. Louis the traffic regulations were rather confusing. Previously, we had been advised by the ever ready constables not to drive too fast and to keep to the right. We got away from St. Louis without any serious mishap, and for no other reason than that we were not caught; I know we violated several traffic ordinances.

Still continuing our route which we found easy to follow from the exact and elaborate maps furnished us by the Goodyear Tire people, we stopped at Booneville, Missouri, over night, and the next day reached my old home, Lexington, Mo. Any man who has been away from home for a period of years and then comes back to meet old friends, school chums and to see the old familiar sights, can appreciate the pleasure I experienced in stopping at Lexington. I fear we delayed here longer than we should have, but it was hard to get away. We left Lexington very early one morning and drove to Kansas City. By this time, we were both anxious to reach our destination. This, however, did not prevent our enjoying to the fullest measure the villages and towns through southern Kansas, where we met our own people and where industry and contentment prevail, and there is a hearty "Peace and Good Will Towards Men" for all. We were on the road over two weeks and I am now a strong advocate of the long automobile trip. One cannot realize the beauty of God's country from the window of a fast moving train and while I must admit that I prefer the easy camp life of the west, of which I am a native, it will not be long before another trip through the east is planned and if I can induce my companion, Mr. Thompson, to accompany me on this second journey, I am sure my pleasure will be complete.

Cedar Vale, Kans. GEO. I. SMITH.

A writer in *Progressive Medicine* claims good results from adrenalin in the treatment of diaphragmatic spasm, broncha-spasm, and pulmonary emphysema.

DYSTOCIA IN A MARE

In May, 1916, I was called to see a mare that could not give birth to her foal. The first thing I noticed upon arrival was a protrusion of the bladder, which had taken place through a small rent in the floor of the vagina. It was filled with urine, but not greatly distended. After carefully cleansing the bladder, it was tapped with a 16 gauge needle, the urine withdrawn and the organ replaced.

On further examination I found the fetus in a transverse presentation and all four feet were protruding beyond the external genitalia. The positoin was left cephaloiliac; that is, the head of the fetus was situated in the region of the left flank of the mother.

Being unable to repel the body of the fetus to any great degree, I decided to do an embryotomy. This was performed according to the general plan as outlined by Williams in his work, "Surgical and Obstetrical Operations." A subcutaneous amputation of both fore legs, including the scapulæ was done and, after repelling the thoracic portion of the trunk of the fetus, a posterior presentation was made. Delivery was then effected with comparative ease.

When the operation was completed, the mare was almost completely exhausted and, of course, suffered some shock, but the effect of stimulants induced a marked beneficial change in the subject. The placental membranes were removed at the time of delivery of the fetus, the uterus was irrigated on the following day and the mare made a nice recovery without further treatment.

G. F. JUNGERMAN, D. V. S.

Hiawatha, Kans.

IMPOTENCY IN ENGLISH BULL DOG

About a year ago I was consulted regarding a very valuable English bull dog, with the history that his sexual strength was on the decline. While he was always anxious to serve the bitch, he was unable to get erection in most attempts; occasionally he would be able to enter; but never complete the act.

Aside from the above there was very little history, excepting that the owner assured me that the animal's stud duties had never been pushed or overdone. He was never allowed more than one bitch each week and often the intervals would be several weeks.

Rectal examination revealed a very sensitive prostate gland, somewhat enlarged. Pressure on the gland caused the animal to whine, and struggle to release himself from the assistant.

Treatment, which brought about a complete recovery:

First a good brisk cathartic was administered. Instructions as to diet and exercise were given. Deep instillations of silver nitrate

into posterior urethra were made, using a small catheter to carry the 5 per cent solution to the desired region. These applications were repeated twice weekly, and at each treatment gentle massage of the prostate was given. Daily rectal injections of warm water, followed with a 20 per cent ichthyol suppository inserted into rectum. (The suppositories made specially for me by Parke, Davis Co.) Internally I prescribed three times daily five grain pill of urotropin, and later two and one-half grain pill of pituitary extract, four times daily. Under the above treatment the animal has made what seems to be a complete recovery, and now serves bitches with as much vigor as any I ever knew of. His owner still brings him to me for treatment twice a month, when he is given silver nitrate injections and prostate massage.

FREDERICK R. WHIPPLE, M. D. V.

Peoria, Ill.

[If the injections were of a solution of two per cent instead of five, as much good would probably result and this with less pain to the subject.—Eds.]

THE TREATMENT OF HEPATIC DISTOMATOSIS (LIVER FLUKE) WITH ETHEREAL EXTRACT OF MALE FERN

M. Gonzalez (Revista Veterinaria *de l'Espana*) has carried out a series of experiments in order to test the value of ethereal extract of male fern in the treatment of sheep affected by liver fluke.

In the first experiment, 600 sheep were treated, each receiving 5 grammes of the ethereal extract in 25 grammes of almond oil, given fasting, and repeated for 4 consecutive days. The parasites disappeared almost completely after the treatment. One sheep was killed shortly after being treated, and on post-mortem 14 distomata were found, but were in a shrivelled condition and almost lifeless. In the second experiment, 300 sheep were treated with an extract containing 15 per cent. of the active principles of the drug. One ewe died after the second dose, four succumbed on the fourth day; in these were found shrivelled parasites having the appearance of dead ants. Two other sheep succumbed after the fourth dose, and in these no parasites were found. After this no further deaths occurred.

In the third experiment, a flock of 300 sheep was reduced to 150, owing to the parasitic disease. Nine animals died the first day, twelve on the second day, the remainder showed marked debility. The treatment was discontinued. After this 11 died and 80 were sold for a small price, as they were in very poor condition. Further treatment was adopted for three days only, during which time 11 sheep died. The remainder recovered rapidly.

The author concludes:—

(1) That distomatosis is curable at all stages of its development.

(2) That some cases of death during treatment must be expected in the advanced stage of the affection.

(3) That, with the official ethereal extract of male fern, four doses suffice to bring about favorable results.—*The Veterinary News.*

NOTES ON THE SURGERY OF FOREIGN BODIES IN THE INTERIOR OF THE EYE

J. Herbert Claiborne, M. D., F. A. C. S., writing in the American Journal of Surgery in discussing the above topic cites at considerable length three cases to illustrate his views. It is interesting (and somewhat consoling) for veterinarians to note that many eye injuries still baffle the surgeon of the human, despite the marked progress that has been made in the practice of human surgery.

Dr. Claiborne states that 75 per cent of foreign bodies in the interior of the eye are magnetic; that other bodies which are found in the eye are stone, wood, glass, lead and copper. The irritating quality of foreign bodies is dependent upon their nature and whether septic or aseptic. If septic, of course, much more harm results in the average instance. The point of entrance of a foreign body is a matter of utmost importance and, also, the parts injured determine largely the course of such affections.

To quote the contribution further: "It matters not how fortunate the results may be in any case or how soon after the accident a successful extraction is made, the future of an eye into which a foreign body has penetrated is always problematical. When a non-magnetic body has passed through the lens and lies anywhere posterior to that structure, the safest thing is to leave it alone. If it happens to be lead or glass, according to my experience, the chances for the eye are better than in the case of other substances, but the safety lies in its becoming encysted and remaining fixed in its position. . . . The invention of the giant magnet and the perfection of the hand magnet have created an epoch in the surgery of magnetic foreign bodies in the interior of the eye. The surgical management of non-magnetic foreign bodies in the interior of the eye remains approximately what it was before."

Wounds of the eye in general practice constitute the most unsatisfactory class of cases that the veterinarian deals with. Nevertheless our methods, too, have improved.—Eds.

HYDRO METHOD OF REMOVING RETAINED PLACENTAE FROM MARES AND COWS

The problem of removing placentae other than by the manual method has been a question given much consideration by prominent veterinarians and associations for several years. The method of manual removal of placentae has been in vogue since veterinary science started, and up to the present, it has not received much elaboration. The method as practiced has many objectionable features, which are dangerous to either operator or patient. Among these are infection, traumatic injury to the uterus and severe metritis. The manual method is also objectionable on account of insufficient arm-length as has been experienced by many veterinarians.

Over against these objections, we have a new method to offer the profession, theorized and developed by Dr. B. L. Engberth and myself. The technic of our method is very simple, and the necessary paraphernalia can be had at little cost.

Before going into the description of the operation, I will give a list of articles to make up the apparatus.

One quarter-inch cannula, ten inches long.

Rubber tube, eight to ten feet long.

Pump and pail.

It is necessary in using the hydro-method that the umbilical cord be intact and accessible to the operator. A large radical of the vein may be used if part of the placenta has been removed. The cannula is introduced into either vein or artery of the cord by a longitudinal incision and held in place by a ligature. The tube and pump are attached to the cannula and the operator is ready to begin.

A saline or antiseptic solution is slowly introduced into the placental tissue, which behaves in a manner similar to that of erectile tissue. As the placenta distends, it comes into juxtaposition with the attachment, and hydrostatic pressure is exerted upon the uterine surface. The chorionic vessels become distended and rupture permitting the solution to pass to the uterine surface of the placenta. The villous processes are detached, and there is a uniform separation of the entire placenta. Uterine contractions are stimulated and aid in loosening the attachment. After the membranes are completely detached, a moderate degree of traction will deliver them.

Clinical Reports

No. 1. On Ocotber 9, 1916, I was called to see a cow that had been in labor six hours. The fetus was removed by traction. The operation left the patient in a very weakened condition and she was unable to stand. I introduced a gallon of saline solution into each vein and there resulted a complete delivery of the placenta in five minutes.

No. 2. On November 7, 1916, I was called to see a cow that had passed part of the after-birth, leaving the remainder attached and protruding. One-half gallon of normal saline solution was injected into the placental tissue by way of one of the large radicals. The after-birth was completely detached and delivered.

No. 3. On February 14, 1917, I was called to an obstetrtical case in a cow. I delivered the fetus, and an examination revealed a firmly attached placenta. A gallon of antiseptic solution was introduced into the placenta and the umbilical cord ligated. The placenta was delivered in two hours.

It is possible to use other agents in the water, such as hydrogen peroxid or permanganate of potash, to favor a more perfect dissolution of attachment.

We find this method handicapped in numerous instances. For example, we are usually called after the placental membranes have been retained forty-eight hours, during which time they have undergone decomposition. In these conditions, the venous construction will not support the pressure that is exerted upon it. In other cases, we find the placenta has been meddled with by the client. He may have torn the cord loose, or possibly part of the placenta has been removed. These conditions that we find handicaps the operation, and they must be taken in hand by the profession and the client educated to the new method. —Ralph R. Shaw, Pittsburgh, Pa., in *The Veterinary Alumni Quarterly.*

PERTINENT CRITICISM

How would this work in all cases of respiratory disturbance?

℞

Quinin sulphate, 10 ounces.
Fluid extract belladonna rad., 2½ pints.
Spirits aether nit., 4 pints.
Water, qs. 5 gallons.

Sig. give one-half ounce on tongue every two hours. Dispense in eight-ounce bottles at $1.00 each.

℞

Spirits aether nit.....2 pints
Fluid extract nux vomica.....3 pints
Fluid extract colocynth.....3 pints
Alcohol .....2 pints
Water .....3 gallons

Dispense in eight-ounce bottles at $1.00 each.

Sig. Give one-half ounce on tongue every thirty minutes for colic or any pains in animals.

These two prescriptions, with Parke, Davis & Co.'s Creolin and a blister, are

used in a large city practice. This is the ultra-scientific treatment given by a graduate in our section. He leaves one of the prescriptions where pain is not manifest and the other where suffering is evident to all observers. Bluff and fraud! We are disgraced by some unprincipled diploma holders in the United States.

Pittsburgh, Pa. JAMES A. WAUGH.

QUESTIONS ASKED BY THE INDIANA STATE BOARD OF VETERINARY EXAMINERS, APRIL 12-13, 1917.

Bacteriology and Parasitology

1. Define immunity and give varieties.
2. Name five common culture media.
3. Name the pus-producing microorganism.
4. What do you understand by Gram-positive and Gram-negative?
5. If you were unexpectedly called upon to properly prepare a rabid dog's head to be shipped to a laboratory for bacteriological examination how would you go about it?
6. Mention two intestinal parasites of the horse. Write a prescription for same.
7. Mention the parasite causing scabies in sheep and state the habits of these parasites.
8. Ascaris Suillâ—tell where found; give description; what animals infested.
9. Spiroptera Sanguinolenta—tell where found; its normal habitat; give a description; animal infested.
10. Ascaris Marginata; nematode worm; tell where found; animal infested; write a prescription for same.

Chemistry

1. What is chemistry?
2. Define incompatibility.
3. How is a quantitative bacterial analysis of milk made?
4. How is milk tested for the presence of (a) boric acid, (b) salicylic acid and (c) sodium bicarbonate?
5. Write the chemical formula for (a) sulphuric acid; (b) nitric acid; (c) potassium iodid; (d) copperas; (e) epsom salts.
6. Give test for formaldehyde in milk.
7. Name three important potassium salts.
8. Give the chemical name and formula of two compounds of ammonia.
9. Give the properties and principal uses of alcohol.
10. Name four elements that enter into the formation of most organic bodies.

Surgery

1. Describe acute and chronic inflammation.
2. What does inflamamtion generally result in?
3. Name and describe four different kinds of tumors.
4. Give cause and treatment of arthritis.
5. Give differential diagnosis between scrotal hernia and hydrocele.
6. Under what conditions would you employ the simultaneous hog cholera vaccination?
7. Define paraphimosis and give treatment.
8. Describe gastrocentiscis, and what is its sequelae?
9. Suggest remedial measures for umbilical hernia.
10. Describe lameness produced by thrombosis of the brachial artery.

Dentistry

1. Name some irregularities of conformation that make work for the veterinary dentist.
2. Give the modus operandi of the examination of the teeth of a horse.
3. Describe the structure of the molar of a horse.
4. Why is it necessary to dress the molars of a horse?
5. Describe the proper manner of trimming and floating the molar teeth of a horse.
6. Name four fractures of the inferior maxilla.
7. Suggest remedial measures.
8. What conditions make trephining necessary?
9. Give treatment for dental fistula.
10. Give treatment for caries dentatum.

Anatomy

1. What is epithelium? Name the different varieties.
2. Describe the development of bone.
3. What is compact and cancellated osseous tissue?
4. Define (a) anatomy; (b) physiological anatomy; (c) pathological anatomy.
5. Name the cranial nerves.
6. Name the tissues involved in an operation for scrotal hernia.
7. Describe the structure of the heart.
8. Name the digestive organs of the ox.
9. Describe the posterior aorta and name its branches.
10. In a case of flatulence where would you insert the trocar and what tissues would you encounter?

Materia Medica

1. What is an official preparation (1) as applied to drugs?
2. What is a renal stimulant? Hepatie stimulants? Sedative? Diaphoretic? Name two drugs acting as each.
3. What is a maximum dose? Minimum dose? Lethal dose?
4. Name three quick acting bowel evacuents used hypodermatically; their physiological actions; give best combination of two or more administered for safety and efficiency.
5. Write a complex prescription using drugs as a tonic.
6. Add 2 decagrams, 1 hectogram, 10 decigrams, 1 gram.

7. How are phosphates formed? Name three phosphates and give therapeutical action.

8. Why is aloes, a dangerous drug, administered? Dosage? When indicated? How soon repeated?

(a) How does aconite kill animal?
(b) How should aconite be administered?
(a) Give antidote for aconite poisoning.

9. Give antidote for strychnin poisoning, arsenical poisoning, morphin poisoning.

10. What drugs could you substitute for belladonna?

Physiology

1. Name four ways in which waste matter is eliminated from the body. Define absorption, excretion, alimentation.

2. Name the physical properties of bone. Give chemical change as age advances.

3. Give the function of leukocytes and red blood corpuscles.

4. Describe the circulation of the blood.

5. What is blood-pressure? Name factors that increase and decrease blood-pressure.
the horse, ox, sheep, hog and dog. Also normal temperature of each.

7. Give blood supply and function of the liver.

8. Classify sebaceous glands, name their secretion and give its function.

9. What is a balanced ration?

10. What is the difference between a sensory and motor nerve?

6. Give normal respirations per minute of

Pathology

1. What is valvular insufficiency? How does it terminate? Why?

2. Describe fully difference between antemortem and post-mortem clot.

3. What is the function of the lymphatic system?

4. What is the most important factor in the prevention of repair?

5. What is osteomalacia? Osteoperocia? Give examples.

6. Where are aneurysms located. Give two causes.

7. How many channels are there for infection to invade the system? Describe them.

8. Describe healing by 1st, 2nd and 3rd intention. Give examples of each.

9. Where is the cerebro-spinal fluid found? Describe it. What is its acidity?

10. What is active immunity? Passive immunity? Congenital immunity?

Obstetrics

1. Name the genital system of the female. What is the specific function of the generative organs?

2. What is meaning of term gestation? Give periods of gestation in mare, cow, sow, sheep, dog and cat.

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3. Describe the changes in the ovary after fecundation.

4. Name two pathological conditions of the fetus that interfere with parturition. State how each may be overcome.

5. What is meant by the term normal parturition? Describe in full the method of delivery in a breech presentation.

6. Give definition, cause, symptoms, treatment, and prognosis of puerperal septicaemia in mare and acute mastitis in cow.

7. Define lochia and give treatment, both as a pathological and physiological condition.

8. Give definition, cause, symptoms, treatment of omphalitis.

9. Give treatment and prognosis of umbilical hernia and scrotal hernia in foals.

10. Give a minute description of how the fetal membranes are expelled. When most liable to be retained. When retained, how soon should they be removed in mare, cow? Describe the removal in each animal.

BEWARE OF THIS FAKIR CLAIMING TO BE DOCTOR HUGHES

A man representing himself as Dr. William V. Hughes of Harrisburg, Pa., posing as a veterinarian, has been defrauding hotels and veterinary supply houses throughout the country. This crook carries cards of Dr. Hughes of Harrisburg, and gives checks signed with that doctor's name. He recently called on a Chicago veterinary instrument house and ordered $48.00 worth of supplies to be sent to his alleged home in Harrisburg. He tendered a check for $125.00 in payment and received the supply company's check for the difference. The real Dr. William V. Hughes of Harrisburg, received the shipment of goods and a receipted bill, but, of course, since he had ordered no goods from the Chicago firm, he returned the shipment. The impostor is described as being between 35 and 40 years of age, slight build, weight about 140 pounds, smooth shaven, slow and deliberate in manners and speech. When he called at the office of the Chicago instrument house, he wore a dark suit, a button of the order of Eagles and a blue A. V. M. A. button such as was distributed at the Detroit meeting last year. He appeared to be well acquainted with veterinary matters and with the names of prominent veterinarians. Readers would do well to be on the lookout for this defrauder and if he is recognized, notify this office, as he is wanted at several places.

Dr. H. R. Groome recently sold his practice at Jewell City, Kans., to Dr. Harvey Frank, and moved to Twin Falls, Idaho.

TWO THOUSAND VETERINARIANS FOR THE NEW ARMY, 500 FOR THE B. A. I.

The announcement is made that the government is in immediate need of 2,000 veterinarians to fill up the veterinary officers reserve corps. Examinations will be held at the various army posts throughout the country and at veterinary colleges, some of which have announcements to that effect in this issue. We shall be glad to supply any information concerning these positions as it becomes available, to those inquiring.

The Department of Agriculture expects to add 480 to their corps of more than 1,200 veterinary inspectors. The additional 480 will be assigned ten to each state, and their duties will consist in watching for outbreaks of contagious diseases, including foot and mouth disease, and also to take all possible measures for the reduction and prevalence of influenza in horses, particularly those animals that are being mobilized for the new army.

WYOMING'S TUBERCULIN TEST LAW

The attention of Wyoming dairy cattle owners is called to the new tuberculin test law, just passed by the last legislature (Chapter 77, Session Laws of Wyoming, 1917). This law provides for the tuberculin testing of all cows in the state supplying milk or cream in cities and towns, or to creameries in Wyoming, and there is a penalty for violation.

No dairy, association, person or persons engaged in the business of selling milk or cream as above, may sell such milk or cream unless they possess a certificate of test, or a special permit from the state veterinarian.

As the tuberculin testing of all dairy cattle in Wyoming could not begin upon the date that this law was effective, the state veterinarian is authorized to issue special permits to owners of such cattle as remain untested while the provisions of the law are being carried out, for the selling of milk or cream in cities or towns or to creameries in this state, without certificate of test. These special permits shall be effective only for the period from the date the same are issued, until proper test and issuance of certificate.

Dr. J. P. Foster, who was state veterinarian in South Dakota from 1901 to 1907, and during the past ten years an inspector in the United States Bureau of Animal Industry, has returned to his former place of residence, Huron, S. D., and intends to make his home there.

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THE VETERINARIAN'S RESPONSIBILITY.

At a recent state veterinary meeting which the writer attended, the president of the association stated that less than fifty per cent. of the tuberculin tests in that state were honest and efficient, and the statement was reiterated by the president of the state board of agriculture.

Of course, the conditions in the state referred to are exceptional. It is only recently that it had any sort of legislation whatsoever governing veterinary practice. The unqualified men outnumber the qualified men three to one, and the customs in the state, or something else, have brought about conditions which have resulted in serious charges of negligence and dishonesty against some few men in the state whose education, training and experience are such that one should expect from them only honest, conscientious, careful work in a matter so important as tuberculin testing, and even from the untrained, the public surely has a right to expect an honest effort in a matter so vital as tuberculin testing.

The veterinarian's responsibility in the matter of tuberculin testing is a grave one. His trust is nothing less than a sacred one, and what the workings of his mind can be by which he can permit himself to certify to the health of diseased cattle, or what sort of a conscience he has that will permit him to continue in such work passes all understanding.

The following correspondence from the office of the state veterinarian of Iowa might be duplicated in the records of almost any state veterinary office or state board of health. Iowa, it may be said, is not the state referred to above in which the tuberculin testing has been only fifty per cent. efficient and honest; and happily enough some progress has been made in Iowa since the letter hereinafter quoted was written, that seems to lessen the likelihood of circumstances such as cited in this letter being duplicated hundreds of times yearly. This matter was brought to our attention at the meeting of the Missouri Valley Veterinary Association in St. Joseph, by Dr. C. S. Parker, whose comment follows Mrs. Oncley's letter:

Dr. J. I. Gibson,
Des Moines, Iowa.

Dear Sir:—At present we have a very sick baby, suffering with tubercular glands, due directly to milk from a cow suffering with a tubercular udder. We used the milk for several months after the baby took sick as we did not suspect our milk supply. Several weeks ago, this cow was severely injured in an accident. A veterinarian was called and found a badly affected tubercular udder.

The man who owned this cow had been treating it for several months, but did not tell me the cow was afflicted in any way. His excuse now is that he did not know the cow was tubercular. He used the milk for his family, and his daughter and another girl both had swollen glands in the neck beginning about the same time our baby took sick.

Our baby has never had any milk except from this cow, so there is no doubt as to the source of the infection. I feel that this man should have been compelled to have had a veterinarian see this cow when the trouble first appeared, or not to have sold the milk.

We people in small towns are at the mercy of the milkman—he can sell us what he likes. In larger cities we can get inspected milk; all we can do here is to trust to fate.

The city council here has promised to pass an ordinance for the inspection of cows, but I feel that the mothers all over the state should have some protection for the lives of their babies and I feel it to be my duty to do all in my power to save other babies from the fate of my own.

I hope this appeal will meet with your help and that we may soon have state inspection of cows.

Yours respectfully,
(Mrs.) L. Oncley.

Fayette, Iowa.

I know that the mother has put the case very mildly; most serious hip trouble has developed since the letter was written. The parents have made several trips with the child to the Mayo Hospital at Rochester, Minn., and to the Hospital of the State University of Iowa. For months the child has been strapped into a steel cast.

I have the permission of Mrs. Oncley to send this to you. To witness the suffering of the young child as well as that of their parents at seeing it subjected to the rigorous treatment necessary, would seem to be enough to awaken pity and arouse earnest endeavor for legislative amelioration.

I am sorry to say that perhaps some measure of a too common apathy combined with a fear of the unconstitutionality of the act prevented the local municipal council from passing an ordinance for protection requiring the tuberculin test of animals from which milk is sold, thus disappointing the hopes of this sorrowing mother. It is a matter of gratification that the constitu-

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tionality of such municipal ordinances seems to be no longer questioned as such ordinances have been passed and are now operative in several cities of Iowa.

Yours very truly,

C. S. PARKER, V. S.

Fayette, Iowa.

A local paper commented on the foregoing case at the time the tuberculosis bill was before the Iowa Legislature as follows:

Maybe it was the story of a little child that had something to do with the introducing of the bill to eradicate tuberculosis in cattle and which has been called one of the greatest constructive measures yet introduced during the present legislature.

Maybe the mental picture of that two-year-old baby, held immovable in plaster cast and steel jacket, had something to do with the messages of two governors, who recommended legislation to control animal tuberculosis in Iowa.

Maybe the story of this little baby's helpless condition had something to do with the fifteen state senators on the committee on agriculture when that committee wrote the great measure to stamp out tuberculosis in the cattle of the state.

Of course, other factors entered and were seriously considered, such as the $3,000,000 annual loss entailed by tuberculosis in the cattle and hogs, but it is suspected that baby fingers tugged at senatorial heart-strings in the writing of the bill.

Baby Oncley's home is at Fayette. Her father is a professor in Upper Iowa university and her mother, before her marriage, was a trained nurse. For some reason the Oncley's were compelled to install a dairy cow as the wet nurse of the baby. Unfortunately the cow had tuberculosis. The udder was infected. The dairyman did not suspect this cow though she had been in ill condition. The parents did not know this. The milk from the diseased udder infected the baby. The lymphatic glands became involved, then the disease extended to the region of the spinal column. The child suffered excruciating pain. Distracted, the parents took their baby to Rochester. The X-Ray diagnosed tuberculosis. Later an operation was performed at the Iowa University Hospital. For six months the little body was held immovable in a steel jacket. An extension was attached to one foot. Through the stifling heat of last summer the baby lay. She is improving, they say, and her parents are hoping for her recovery. Maybe, if she lives she will not need to walk with crutches. Maybe

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This book contains also a chapter on "Collections," by Dr. Campbell, in which the writer gives at length the principles of prompt collections, and describes fully methods for collections that have proved successful with him in large and small practices and from both a farm and a city clientele. It is an eminently practical article and should enable any veterinarian whose collections are not satisfactory to increase the percentage of his collections and hold his patrons more firmly.

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she will not be deformed. She is only two years old now, but her sufferings cannot be forgotten.

And thousands of other Iowa babies are daily imperiled. The tuberculosis dairy cow is a menace to them. The state has blundered long enough. Maybe baby Oncley's crucifixion will save the lives and bodies of the thousands.—Daily Dispatch.

D. M. C.

PETERS STATE VETERINARIAN OF ILLINOIS

Dr. A. T. Peters has been appointed State Veterinarian of Illinois, to succeed Dr. O. E. Dyson, resigned. Dr. Peters brings to the office of state veterinarian of Illinois, perhaps all things considered, the most important state veterinarian office in the union, a large and fruitful experience. Although born and reared in Chicago, Dr. Peters was graduated from a European veterinary school in June, 1893, and joined the American Veterinary Medical Association in October of that year.

In 1894 he went to the University of Nebraska as head of the Department of Animal Pathology, succeeding the late Dr. Frank S. Billings. He was with the University of Nebraska for just sixteen years and resigned to accept the position of bacteriologist for the Illinois Live Stock Commission, which position he held for a little more than four years, resigning in 1914 to become secretary and general manager of the Elmore Live Stock Co., of Peoria, in which capacity he has since been employed.

Since coming to Illinois seven years ago, Dr. Peters has been very active in state veterinary affairs, and is known to every member of the state association. Since becoming associated with the Elmore people, he has been a prominent figure in the live stock industry of the state and is a member of various live stock breeders' associations.

During his period of service in Nebraska he was often engaged in farmers' institute work and since coming to Illinois, he has given some attention to this, and is recognized by the agricultural industry of both states as an authority on veterinary and live stock matters.

The position of state veterinarian of Illinois is not an easy one. There appears to be a wide diversity of opinion as to how the work of that office should be conducted. The state dairy association, one of the strongest political associations of the state, has one view; the rest of the live stock industry has a different opinion; the immense live stock commission interests at the Union Stock Yards see things from

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yet a different angle and the veterinarians of the state, of whom there are 1,535, almost twice the number that are practicing in any other state, are very positive that all three of the foregoing are wrong and that a plan differing from all offers the only solution of the many difficult problems.

Dr. Peters enjoys the confidence of all four of these different elements to an unusual degree, and while the task that he now undertakes is an onerous and exacting one, his many friends doubt not he will acquit himself with credit.

WEST VIRGINIA VETERINARY MEETING

A meeting of the West Virginia Veterinary Association was called at Parkersburg, April 4th, by its president, Dr. Bradley. Dr. S. E. Hershey acted as secretary in the absence of the regular secretary, Dr. E. Layne. The purpose of the meeting was to discuss subjects for the betterment of the profession in the state, and make arrangements for their regular meeting which meets the first week in July. This association was organized in 1900 by eight graduates, all that were in practice in the state at that time. Dr. S. E. Hershey acted as secretary for the first eight years; then was president for a term of six years and in that time the membership grew to fifty-six members. At our next meeting we hope to add at least six more members, as that many new men have graduated this year and located within the state.

Charleston, W. Va. S. E. HERSHEY.

THE UNITED STATES COLLEGE OF VETERINARY SURGEONS ALUMNI MEETING

The Alumni Association of The U. S. College of Veterinary Surgeons held its twenty-first annual and smoker at the Raleigh Hotel, Washington, D. C., Friday evening April 13th. Sixty-five graduates attended and were entertained by Maj. Jarrell Griffith, U. S. A. Vet. Corps, who spoke on the advantages of the army. Dr. J. G. Ferneyhough, State Veterinarian of Virginia, Dr. H. J. Holt, Chief Veterinarian of West Virginia, and Dr. H. P. Flowe, Asst. State Veterinarian of North Carolina, spoke with reference to their respective states.

Local entertainers furnished the social program. A buffet luncheon was served and appropriate souvenirs were distributed.

The following officers were elected: Dr. H. S. Gamble, '08, President; Dr. Harry Lucus, '17, Vice President, and Dr. C. M. Mansfield, '07 (permanent) Secretary and Treasurer.

The next meeting will be held in Washington during April, 1918.

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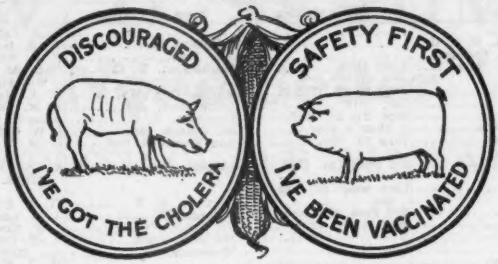

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ASSOCIATION MEETINGS

The information given below is up-to-date and has been furnished by the secretaries of the various associations listed. Secretaries are requested to supply us data regarding their associations after each meeting; otherwise, the association will necessarily be dropped from the list. We ask secretaries to kindly co-operate with us in keeping before the members of their associations the date and place of the next meeting.

Name of Association	Date of Meeting	Place of Meeting	Secretary
Alabama Vet. Med. Assn.	.....	.....	C. A. Cary, Auburn, Ala.
Alumni Assn., Col. of Vet. Med., O. S. U.	.....	Columbus, O.	W. R. Hobbs, O. S. U., Columbus, O.
Alumni Assn., N. Y. State Vet. College	.....	New York	P. K. Nichols, Port Richmond, N. Y.
Alumni Assn., U. S. Col. Vet. Surg.	April 1918	Washington, D. C.	Chas. M. Mansfield, 1344 Newton St., Washington, D. C.
American Vet. Med. Assn.	Aug. 20-23, 1917	Kansas City, Mo.	L. A. Merillat, 1827 Wabash, Chicago.
Arkansas Vet. Med. Assn.	Jan. 1918	Little Rock, Ark.	R. M. Gow, Little Rock.
British Columbia Vet. Assn.	Sept. 21, 22, 1917	Penticton, B. C.	Kenneth Chester, New Westminster, B. C.
B. A. I. Vet. Assn. of So. Omaha	4 times a year	So. Omaha, Neb.	J. W. Giffen, c/o B. A. I., So. Omaha
California State Vet. Med. Assn.	June 13, 14	San Francisco, Cal.	F. M. Hayes, Davis, Cal.
Central Canada Vet. Assn.	3rd week Jan. 1918	Ottawa, Ont.	A. B. Wickware, Experimental Farm, Ottawa.
Central N. Y. Vet. Med. Assn.	Last week in June and Nov.	Syracuse, N. Y.	W. B. Switzer, Oswego, N. Y.
Chicago Vet. Society	2nd Tues. of month	Chicago, Ill.	A. A. Leibold, 4615 N. Robey St., Chicago.
Colorado Vet. Med. Assn.	May 31 and June 1	Ft. Collins, Colo.	L. E. Newsom, Ft. Collins, Colo.
Connecticut Vet. Med. Assn.	.....	Hartford, Conn.	A. T. Gilyard, Waterbury, Conn.
Eastern Iowa Vet. Med. Assn.	Dec. 18	Muscatine, Ia.	Jno. Tillie, Muscatine, Ia.
Genesee County Vet. Med. Assn.	.....	.....	W. J. Houden, Flint, Mich.
Genesee Valley Vet. Med. Assn.	July	Rochester, N. Y.	J. H. Taylor, Henrietta, N. Y.
Georgia State Vet. Assn.	Sept. 18, 19, 1917	Columbus, Ga.	Peter F. Bahnsen, Capitol Bldg., Atlanta.
Hudson Co. Vet. Practitioners' Club.	Monthly	Jersey City, N. J.	B. D. Blair, 782 Montgomery St., Jersey City, N. J.
Idaho Assn. of Vet. Graduates	.....	Boise, Idaho	C. V. Williams, Blackfoot, Idaho.
Illinois State Vet. Med. Assn.	July 18, 19	East St. Louis, Ill.	L. A. Merillat, 1827 Wabash Ave., Chicago.
Illmo Vet. Med. Assn.	April, 1917	Collinsville, Ill.	L. R. McKinley, Freeburg, Ill.
Indiana Vet. Med. Assn.	Jan. 1918	Indianapolis, Ind.	Geo. H. Roberts, Indianapolis, Ind.
Iowa Vet. Med. Assn.	.....	Ames, Iowa	H. B. Treman, Rockwell City, Ia.
Kansas Vet. Med. Assn.	.....	Wichita, Kan.	J. H. Burt, Manhattan, Kan.
Kentucky Vet. Med. Assn.	June 20-21, 1917	Shelbyville, Ky.	D. E. Westmorland, Owensboro, Ky.
Keystone Vet. Med. Assn.	2nd Tuesday of month	Philadelphia	L. B. Davis, 857 E. Girard, Philadelphia.
Lake Erie Vet. Med. Assn.	1st Tuesday in Dec.	Norwalk, O.	N. D. Backus, Elyria, O.
Los Angeles Vet. Med. Assn.	3rd Wed. of month	Los Angeles	J. A. Dell, 16th & Pacific, Los Angeles.
Maine Vet. Med. Assn.	July 11, 1917	Bangor, Me.	M. E. Maddocks, Augusta, Me.
Manitoba Vet. Assn.	.....	Winnipeg, Man.	W. Hilton, 275 James St., Winnipeg.
Massachusetts Vet. Assn.	4th Wed. each month	Worcester in Sept.; Boston rest of year	E. A. Cahill, Boston, Mass.
Michigan State Vet. Med. Assn.	1st Tues. & Wed. after 1st Mon. in February	Lansing, Mich.	W. Austin Ewalt, Mt. Clemens, Mich.
Minnesota State V. M. Assn.	2nd Tues. & Wed. Jan.	St. Paul	G. Ed. Leech, Winona, Minn.
Mississippi State Vet. Med. Assn.	January 8-9, 1918	Meridian, Miss.	E. S. Norton, Greenville, Miss.
Mississippi Valley Vet. Med. Assn.	.....	Galesburg, Ill.	W. Lester Hollister, Avon, Ill.
Missouri Valley Vet. Assn.	.....	St. Joseph, Mo.	R. F. Bourne, 1336 E. 15th, Kansas City.
Missouri Vet. Med. Assn.	Last week in July	Neosho, Mo.	C. D. Folse, 1336 E. 15th St., Kansas City
Montana Vet. Med. Assn.	Sept. 26-27, 1917	Helena, Mont.	A. D. Knowles, Missoula, Mont.
Nat'l Assn. B. A. I. Employees	2nd Mon. in Aug., 1917	Omaha, Neb.	S. J. Walkley, 125 N. W. Ave., Milwaukee
Nebraska Vet. Med. Assn.	2nd Tues. & Wed. in Dec.	Lincoln, Neb.	S. W. Alford, Lincoln, Neb.

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Name of Association	Date of Meeting	Place of Meeting	Secretary
New York State Vet. Med. Society	July 25, 26, 27	Brooklyn, N. Y.	C. P. Fitch, Ithaca, N. Y.
North Carolina Vet. Med. Assn.	June 26, 27, 1917	Charlotte, N. C.	J. P. Spoon, Burlington, N. C.
North Dakota Vet. Assn.	July, 1917	Fargo, N. D.	W. J. Mulroony, Havana, N. D.
Northeastern Indiana Vet. Assn.	Oct. 9, 1917	Ft. Wayne, Ind.	R. M. Boyd, Avilla, Ind.
Northwestern Ohio Vet. Med. Assn.	Feb. 21	Toledo, O.	Paul E. Wood, Ottawa, Ohio.
Ohio State Vet. Med. Assn.	Jan. 10, 11, 1918	O. S. U. Columbus, O.	F. A. Lambert, care O. S. U., Columbus.
Ohio Valley Vet. Med. Assn.	July	Oakland City, Ind.	C. S. Henry, Terre Haute, Ind.
Oklahoma State Vet. Med. Assn.	May 3, 4	Oklahoma City	R. C. Smith, Enid, Okla.
Oregon Vet. Med. Society	June, 1917	Probably Salem, Ore.	B. T. Simms, Corvallis, Ore.
Pennsylvania State Vet. Med. Assn.		Harrisburg, Pa.	E. H. Yunker, 2344 N. 18th, Philadelphia.
Rhode Island Vet. Med. Assn.	2nd Tues. Jan.		U. S. Richards, Woonsocket, R. I.
Schuylkill Valley Vet. Med. Assn.	June 20	Reading, Pa.	C. R. Potteiger, Reading, Pa.
South Dakota Vet. Med. Assn.	July	Watertown, S. D.	S. W. Allen, Watertown, S. D.
Southeastern States Vet. Med. Assn.	Dec. 27, 28, 29, 1917	Chattanooga, Tenn.	G. A. Roberts, West Raleigh, N. C.
Southern Aux. Cal. State Vet. Med. Assn.	June 13	San Francisco	J. A. Dell, 16th & Pacific, Los Angeles.
S. W. Michigan Vet. Med. Assn.	January, 1918	Niles, Mich.	L. A. Minter, Niles, Mich.
Tenn. Vet. Med. Assn.	Nov. 7, 8, 1917	Columbia, Tenn.	F. R. Youree, Lebanon, Tenn.
Texas Vet. Med. Assn.	June 14, 15	Ft. Worth, Tex.	E. M. Wiggs, Greenville, Texas.
Tri-County Vet. Med. Assn.	March 14	Liberty, Ind.	Geo. G. Ferling, Richmond, Ind.
Twin City Vet Med. Society	Once a month	St. Paul	C. C. Palmer, St. Paul, Minn.
U. S. Live Stock Sanitary Assn.		Chicago	H. S. Ward, St. Paul, Minn.
Utah Vet. Med. Assn.		Logan, Utah	E. P. Coburn, Brighton City, Utah.
Veterinary Assn. of Saskatchewan		Regina, Sask.	R. G. Chasmar, Hanley, Sask.
Vet. Med. Assn. of New Jersey	2nd Thurs. in Jan.	Trenton, N. J.	E. L. Loblein, New Brunswick, N. J.
Vet. Med. Assn. of N. Y. City	1st Wed. ea. mo. except July, Aug., Sept.	New York City	R. S. MacKellar, 351 W. 11th St., N. Y.
Vet. Med. Assn. of Geo. Washington Univ.	1st Sat. each month	Washington, D. C.	C. W. Rippon, 2115 14th St., N. W., Washington, D. C.
Vet. Med. Society Wash. State College	1st and 2nd Tues. ea. mo.	Pullman, Wash.	Claude Holden.
Virginia State Vet. Med. Assn.	July 12, 1917	Norfolk, Va.	W. G. Chrisman, Blacksburg, Va.
Washington State Vet. Med. Assn.	June, 1917	Pullman, Wash.	Carl Cosler, Bellingham, Wash.
West Virginia Vet. Med. Assn.	July 5, 6, 1917	Parkerburg, W. Va.	E. Layne, Huntington, W. Va.
Western Michigan Vet. Med. Assn.	June 15, 1917	Allegan, Mich.	C. S. McGuire, Grand Rapids, Mich.
Western N. Y. Vet. Med. Assn.	4th week, June, 1917	Buffalo, N. Y.	F. F. Fehr, 36 Prospect Ave., Buffalo.
Wisconsin Vet. Med. Assn.		Madison, Wis.	W. A. Wolcott, Madison, Wis.
York Co. Vet. Med. Society	1st Tues. after 1st. Mon. of each month	York, Pa.	E. S. Bausticker, 335 Newberry, York, Pa

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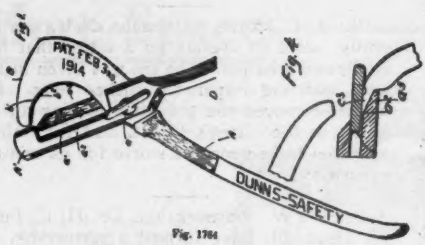

Fig. 1784

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J. F. ROSER, D. V. S.,
IN CHARGE

Dr. John Gass, of New Augusta, Ind., was killed at a rail crossing when a Big Four passenger train struck his automobile, April 14th. Dr. Gass was 39 years old and is survived by his widow.

Miss Clare Lamplugh, who came from London to California some time ago, has just completed a course in veterinary medicine and opened a cat and dog hospital at San Francisco.

Dr. Lewis W. Kitchen and Miss Lillie Pope, of Post City, Texas, were married April 29th. They will make their home at Post City.

Dr. Roderick Dhu Eaton, of Minneapolis, Minn., died April 13th, aged 58 years. He had been in practice at Minneapolis for many years, also having practiced at Hastings and Fergus Falls.

Dr. W. Horace Hoskins, dean of the New York State Veterinary College, estimates there are only about 1,250,000 horses in the United States fit and available for artillery or cavalry service. He places the total supply of horses in the country at 25,000,000, of which more than 20,000,000 are in active service, 50 per cent of the remainder being too heavy for military use and 25 per cent too old or physically unsound.

Dr. H. P. Morris, of Omaha, Neb., was recently called to operate on a kitten that had swallowed a hatpin. The pin was seven inches long and the kitten ten inches long. Dr. Morris removed the pin after making an incision in the kitten's throat, and the animal appeared to be none the worse for its unusual experience.

Dr. W. W. Warnock and Dr. H. C. Pugh, of Aledo, Ill., have formed a partnership for practice in that city. Dr. Pugh is a recent graduate of the McKillip Veterinary College, Chicago.

Dr. J. O. Young, of Topeka, Kans., has filed a suit for $105.50 against the St. Joseph Horse & Mule Company and the Santa Fe Railroad for medical services rendered to a number of horses that were hurt while escaping from a train at Topeka.

A new ordinance has been drafted at Cape Girardeau, Mo., making cruelty to animals punishable by a fine of from $25 to $100.

According to a report of the Office of Farm Management and the Bureau of Crop Esti-

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Filling Vials with Bacterial Vaccine

This is the season to watch for the appearance of this disease.

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Prices

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4 doses,	3 c.c.	1.25
12 doses,	3 c.c.	3.00
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12 doz.	3 c.c.	27.50

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mates, United States Department of Agriculture, there were at the first of this year 34,371 farm tractors in use in the United States. Of this number, Illinois has the most, or 3,202; Kansas next with 2,287, and Rhode Island has the least—30.

Dr. J. A. Roberts, who graduated from the Chicago Veterinary College this spring, purchased the practice of the late Dr. J. J. Pink, of Oconomowoc, Wis., during the latter part of April and has established himself in that city.

Dr. William Ellwitz, of Milwaukee, Wis., who had practiced in that city for many years, died on April 13th. He had been seriously ill since last November. Dr. Ellwitz was 56 years old and is survived by his widow, a son, Dr. William Ellwitz, Jr., also a veterinarian, and five daughters.

The South Dakota Veterinary Medical Association was incorporated in that state on April 20th by Dr. J. E. Phelps and Dr. A. G. Ferrin, of Pierre, and Dr. H. P. Faber, of Mitchell.

Dr. Rupert Olson has located for practice at McFarland, Wis.

Dr. Roy Buell, of Vandalia, N. Y., erected a veterinary hospital in that city recently.

Dr. M. B. Purdy has located in Choteau, Mont.

Dr. T. Grefsheim recently established a veterinary hospital at Deerfield, Wis.

An injunction was issued on April 13th, restraining Dr. F. C. Wyland from practicing in Emmetsburg, Iowa, or within twenty-five miles of that town. Dr. Wyland is said to have sold out to Dr. Lars Potter and agreed not to locate in that vicinity for five years.

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BECAUSE it is one of the most powerful antiseptics at the physician's disposal. According to Dakin, in 1 to 1,000,000 aqueous solutions of Chlorazene the streptococcus is destroyed in two hours.

BECAUSE it is a definite chemical compound, not an indefinite mixture.

BECAUSE it is supplied in tablets, and in bottles containing weighed quantities for the extemporization of solutions of standard strength ready for immediate use.

BECAUSE it is stable whether used in tablet, powder or solution. Stock solutions preserve their antiseptic powers, virtually unimpaired, for months.

BECAUSE it does not coagulate the albumens of the tissues with which it comes in contact, therefore does not lower tissue resistance as do most other antiseptics. Chlorazene has been successfully employed in war wounds in Europe.

It is being used by the leading veterinary surgeons of America with unusually satisfactory results.

Try Chlorazene in fistulous withers, poll-evil, quittor, collar and saddle galls, wounds and ulcers of all kinds, and as a disinfecting douche in pyometra and contagious abortion in cows.

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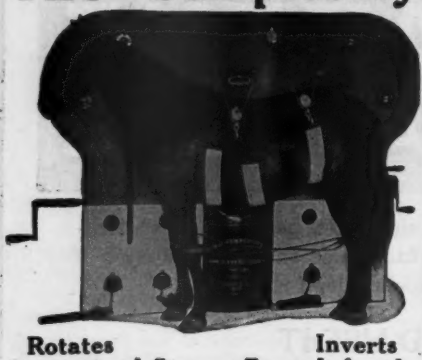

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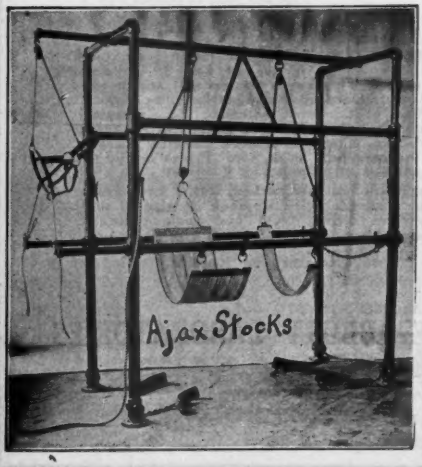


Dr. C. A. Forbes, formerly of Ladd, Ill., purchased the practice of Dr. Thayer. at La Salle, Ill., and has established himself at the latter place.

During the thirty months ending with March 1, 1917, it is reported there were shipped out of this country 853,116 horses and 289,062 mules, practically all of which were for military purposes.

Dr. W. D. Livermore has located for practice at Ashland, Ill.

Dr. P. O. Johnson, of Annawan, Ill., recently operated on a milk cow with a broken leg, amputating the injured member and replacing it with a wooden one. The artificial limb is said to have proved satisfactory and the cow is able to get around almost as well as if she had four natural legs.

Dr. Dwight Civil, who graduated this spring, has located for practice at Seymour, Ill.

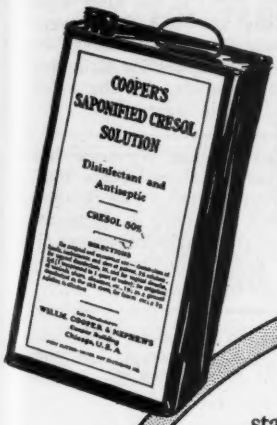
The Reading Truck Co., Detroit, Mich., one of the largest hauling concerns in the United States, expects eventually to have 500 horses in its stables. The company handles 50 tons of freight a day, and one day last summer handled 500 tons. Early last summer, 150 horses were being used, and it was found necessary to buy 100 more. The concern maintains its own horse hospital.

Dr. S. G. Bittick has been appointed city veterinarian of Ft. Worth, Texas.

Dr. J. M. Brooks, of Saginaw, Mich., while treating a dog, April 6th, was bitten by the animal, which was afterwards found to have rabies. Dr. Brooks took the Pasteur treatment.

The South Dakota state live stock sanitary board recently granted licenses to practice to the following veterinarians who passed the examination: Dr. P. T. Dempsey, Waubay; Dr. James O'Boyle, Hot Springs; Dr. G. G. Faber, Mitchell; Dr. John T. Dinwoodie, Brookings; Dr. P. H. Canakis, Milbank; Dr. H. A. Michel, Carthage; Dr. W. L. Scofield, Pierre; Dr. Wm. D. Odu, Lemmon; Dr. J. L. Shabram, Oelrichs; Dr. Clifford Bratager, Montrose; Dr. D. Coughlin, Woonsocket; Dr. L. H. Murty, Deadwood; Dr. Jay M. Bailey, Parker; Dr. T. L. Bunn, De Smet.

The Montgomery County Veterinary Medical Association recently met at Crawfordsville, Ind., and completed its organization. Dr. J. G. Heighway, of Ladoga, Ind., is president and Dr. A. B. Niven, Crawfordsville, secretary. Steps to aid in increasing



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The leaders of your profession have given us their corroboration. They inform us that they have made **Cooper's Saponified Cresol** a standard item of their Materia Medica. You will find it especially efficacious in checking intestinal fermentation, in relieving bloating in cattle and sheep and in destroying stomach and intestinal worms.

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the food production of the country were discussed. A plan was decided upon whereby the association will act as agent for farmers who are in the market for feeders and those who have immature or unfinished animals for sale; also for breeders who have breeding stock for sale and those who wish to purchase such stock. It was pointed out that much waste is caused by the slaughter of animals before they are finished and also by the slaughter of those adapted for breeding. This is in line with the campaign started by Dr. L. E. Northrup, acting state veterinarian of Indiana, who has especially emphasized the necessity of stopping the sale of light hogs for immediate slaughter. Farmers who have such hogs have been urged to list them with the state veterinarian, who will find buyers among farmers having corn to feed them. In this way hogs will go to market for slaughter at 200 instead of 100 pounds, and the extra weight can be added within ninety days.

Dr. B. F. Davis of Douglas, Wyoming, has been appointed as an appraiser for the Federal Land Bank in that district. The *Douglas Enterprise* states that Wyoming is fortunate in this selection, as Dr. Davis knows conditions in the west and is familiar with the needs of farmers there.

Dr. Haskell Lett, of Seymour, Ind., has been appointed a deputy veterinarian and will be in charge of several counties in the southern part of the state.

The recent prohibition bill in Nebraska, unlike that of Iowa, permits veterinarians to make prescriptions containing alcohol the same as physicians, but each prescription of this kind must show the name and owner of the animal to be treated.

The New York Senate has passed the Wicks bill, providing that dogs running at large without a license may be shot on sight, while all dogs, whether licensed or not, which are

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A reliable and inexpensive treatment for Fistula of the Withers, Poll-Evil, Actinomycosis and all fistulous tracts. Your money will be cheerfully refunded if you are not satisfied with results. Sold to Veterinarians exclusively. Price $1.00 per dozen.

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caught pursuing domestic animals, may be summarily killed. The aim of the bill is principally to protect the sheep industry of the state. Dr. W. Horace Hoskins, dean of the New York State Veterinary College, has taken exception to the measure, stating that the unchecked spread of parasitic diseases and not molestation by dogs, has caused the sheep industry to languish in New York State.

A BIG CATTLE SALE

One of the greatest sales of cattle of any beef breed ever held in the United States was the dispersion of the noted herd of Herefords owned by Cyrus A. Tow, Norway, Iowa, which was held on April 24th and 25th. This offering was one of the greatest ever offered of any beef breed and buyers were attracted from over half the states in the Union, and the cattle were sold over a wide range of territory. The Standards and Disturbers, for which the Tow herd has been noted and whose get were prominent winners at all of the leading shows during the past few years, were in great demand. As was expected, Disturber, Jr., the great prize winner and a proven sire, topped the sale, selling for $9,100 to M. I. Masterson. Incomparable, a prize-winning three year old, brought $3,600, selling to Letts & Turkington. John Cahill purchased a number of the best females and selected Standard, the eight-year-old sire, at $3,000 to

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8. Choke.
9. Hygroma of the Withers.
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12. Melanosis.
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31. Diseases of the Heart.
32. Azoturia.
33. Transient Crural Paralysis.
34. Lymphangitis.
35. Epizootic Lymphangitis.
36. Foot Scab.
37. Foot Rot in Colts.
38. Umbilical Hernia.
39. Paralysis of the Cauda Equina.
40. Agalactia in Mares.
41. Strangles.
42. Influenza.
43. Infectious Cerebro-Spinal Meningitis.
44. Erysipelas.
45. Septicemia.
46. Malignant Edema.
47. Purpura Hemorrhagica.
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head his herd. John Turnbull & Son secured Standard 36th, an outstanding son of the great sire, Standard, for $2,800. Maple's Lass 55th, an outstanding two-year-old show heifer, topped the female offering, selling for $3,200 to J. Crouch & Son, who have one of the choice collections of the breed. E. B. Gooch secured Lady Brummel, one of Disturber's best daughters, with a splendid heifer calf at foot, for $2,750. Warren T. McCray selected several grand daughters of Disturber at good figures.—*Iowa Homestead.*

This herd of 159 head was tuberculin tested by Drs. Glenn and McCabe, assistant state veterinarians, of Norway, Ia. It was the largest individual herd ever tested in Iowa.

PREPARED FOR CONSULTATION WORK ON CONTAGIOUS ABORTION

Dr. P. H. Browning of San Jose, California, is the recipient of a splendid and sensible write-up in a recent issue of the *Pacific Dairy Review.* Dr. Browning spent some time at Cornell University during the past winter studying the problem of contagious abortion under the direction of Professor W. L. Williams, and the *Pacific Dairy Review* in the name of the Pacific Coast dairymen welcomes him to their midst.

Dr. Francis X. McGuire, chief assistant veterinary officer of the British Remount depot, and Miss Madeline James of Newport News, Va., were married April 21st. The hospital staff of the British Remount Commission presented Dr. McGuire with a silver service as a wedding gift. The presentation also included two silver vases for the bride-elect. The affair was held at the Hotel Warwick, Newport News, and toasts and address by Major Barry and members of the staff marked the occasion. The meeting closed with the singing of the "Star Spangled Banner."

POSITION OF STATE VETERINARIAN NOT THE TOY OF POLITICS IN COLORADO

Dr. Chas G. Lamb of Denver, has just been appointed state veterinarian of Colorado for a term of two years. Dr. Lamb has already served sixteen years in this office, and thus enters upon the seventeenth year of his official duties of the state with the present appointment. The value to the state of the policy that keeps efficient officers in the same position year after year need not be pointed out.

A bill was passed in Iowa the latter part of April, permitting dentists and veterinarians having permits to obtain alcoholic liquors the same as do physicians.

Dr. J. W. Oltmanns of Watseka, Ill., has been appointed assistant state veterinarian.

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The process preparation as practiced in Japan has been further developed by the Lederle Antitoxin Laboratories by concentrating and refining the product to such an extent that Blackleg Filtrate—Lederle—subcutaneously injected in *1 c. c. doses* will afford sufficient immunity to cattle to protect them against the natural infection for a period of about one year. *There is no conclusive evidence available that any product offers protection for a longer period than this.*

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Various strains of B. Abortus isolated from many cases of contagious abortion in cattle, are cultivated on suitable culture media, suspended in physiological salt solution and rendered sterile, after which 0.25% trikresol is added.

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Lederle

—For The—

Prevention of Hemorrhagic Septicemia in Cattle

INDICATIONS: *Hemorrhagic Septicemia Vaccine* has proven effective for the immunization of cattle against hemorrhagic septicemia. The injection of vaccine will produce a resistance in the animals against the B. bovisepticus and thereby check the spread of the disease.

In the preparation of Lederle's *Hemorrhagic Septicemia Vaccine* various strains of the B. bovisepticus, isolated from outbreaks of hemorrhagic septicemia in cattle, are cultivated on suitable culture media, suspended in physiological salt solution and rendered sterile, after which 0.25% trikresol is added.

DOSAGE: A suspension of 20 billion of killed organisms has been found most effective for immunization purposes. *Two cubic centimeters* containing the desired number of organisms constitute an immunizing dose. Usually a single injection is sufficient to confer immunity; in exceptional cases, however, if the losses continue, a second injection may be given in from 5 to 7 days.

METHOD OF ADMINISTRATION: *Hemorrhagic Septicemia Vaccine* is administered subcutaneously and preferably in the neck, midway between the head and shoulder, using an ordinary hypodermic syringe which has been previously sterilized. At the point of injection the skin should be thoroughly cleansed with a suitable antiseptic solution.

PACKAGES: *Hemorrhagic Septicemia Vaccine* is marketed by the Lederle Antitoxin Laboratories in packages containing 6 vials, each vial containing a complete protective treatment for one animal.

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Repeated observations have established that different strains of the colon organism as well as organisms of the para-colon group are responsible for this disease.

LEDERLE'S ANTI-WHITE SCOURS SERUM is obtained from horses which have been at first treated with suspensions of dead organisms containing various strains of B. coli, paracoli, metacoli, abortus, aerogenes and enteritidis. After the preparatory treatment, live cultures are injected intravenously into the horses, beginning with small amounts until the highest tolerance is reached. The serum is subjected to the agglutination test against the various strains used and it is required that the serum agglutinate each respective strain in a dilution of at least 1 to 1,500.

Preventive doses of 10 c. c. @ $0.60 per dose.

Curative doses of 30 c. c. @ $1.50 per dose.

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POSITION WANTED—With good reliable veterinarian. Can furnish references. Single. Age 25. Graduate of 1916. Will go anywhere. Write or wire No. 265, care of VETERINARY MEDICINE.

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WANTED—Graduate veterinarian. Splendid field. Sponsorship of druggist. Free office rooms and living rooms. Population 1,000, in North Dakota; 25 miles territory; good farming community. Town lively. A $45,000 hotel being built. Write 1177, care F. V. Kniest, Bee Bldg., Omaha, Neb.

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FOR SALE—Good veterinary practice and stock of drugs in Central Kansas, cheap; can rent hospital. Going into army. Address No. 271, care of VETERINARY MEDICINE.

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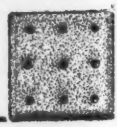

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Dr. Benjamin H. Dunkley, of Kalamazoo, Mich., has filed a voluntary petition of bankruptcy in the United States District Court, listing his liabilities at $914.40 and assets as $180 with exemptions of $180.

STILL FAKING

In the May issue of the JOURNAL, warning was given to readers to watch out for a crook traveling through the country, posing as a veterinarian and fraudulently cashing worthless checks and drafts. Keep on the lookout for this man and if he appears in your locality (see description of the man and methods he pursues on page 340 of the May issue of the JOURNAL) advise us.

Since leaving Chicago, he has been heard of in Lewiston, Idaho, where he pursued the exact methods described in the JOURNAL, but unfortunately he had made his harvest and disappeared from Lewiston on the very day that the May issue of the JOURNAL arrived there.

Watch for him.

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INVITES THE A. V. M. A. TO THE SOUTH

Whereas, the A. V. M. A. has held but one session in the South since its organization, and whereas the veterinary profession in the South is anxious to have the privilege of entertaining this organization, be it resolved that the Southeastern States Veterinary Medical Association, in regular annual meeting assembled, urge the A. V. M. A. to hold their 1918 meeting in the city of Atlanta, Ga. Nothing that the A. V. M. A. could do would have a more uplifting influence on the profession in the South than to grant this, our urgent request.—*Resolution adopted by the Southeastern States Veterinary Medical Association.*

Dr. E. L. Quitman has just been appointed examiner and is authorized to examine professionally fifty graduates of the Chicago Veterinary College who may be candidates for appointment in the Veterinary Officers Reserve Corps of the United States Army.

Each candidate is to be examined physically by a medical or medical reserve officer of the army. Minor physical ailments, debarring applicants for service in the regulary army, are overlooked for this service.

It is reported that Dr. T. S. Burnett, of Springfield, Ohio, will be appointed state veterinarian to succeed Dr. A. S. Cooley.

Dr. Oscar F. Newell, of Plainview, Neb., was instantly killed when his car was hit by a passenger train, May 8th. Dr. Newell leaves a widow and a 16-year-old daughter.

Dr. H. V. Jacobson has opened an office at Morton, Minn.

The third annual short course for veterinarians at the Washington State College will be held at Pullman, Wash., June 4th to 9th. Dr. S. B. Nelson will be in charge. The special faculty will include Dr. Howard Welch, Montana Agricultural College; Dr. B. T. Sims, Oregon Agricultural College; Dr. E. T. Baker, assistant state veterinarian of Idaho; Dr. R. J. Donahue, state veterinarian of Washington; Dr. Robert Prior, of North Dakota; and Dr. Geo. T. Potter, of Washington, D. C.

Dr. Edward F. Koehler, of Easton, Pa., aged 46, died at his home May 3rd.

A law to control hog cholera was passed at a recent session of the Missouri legislature. The bill forbids the sale or driving of diseased swine; requires the burning of hogs that die of any disease, and specifies that the owner of diseased swine must notify his neighbors.

FISTULA OF THE WITHERS

By PROFESSOR L. A. MERILLAT, V. S.

Editor Department of Surgery, American Journal of Veterinary Medicine.

PREFACE.

There are several reasons why a manual on this disease should be introduced into the veterinary literature of the day, the chief one being that fistula of the withers is a very prevalent disease of horses and thus exacts a big toll from the horse industry. Another reason for bringing it especially to the attention of readers of veterinary literature is the deplorable fact that its treatment has never been standardized in the veterinary profession. Almost all old and common complaints of domestic animals of a serious character are handled according to definite plans, differing only in minor details. The many conferences of our teachers of surgery in association work, and the interchange of ideas made possible by the splendid journals which live veterinarians now all read, as well as the profusion of all kinds of literature that reaches everyone, have fortunately created a standard of treatment for nearly all of the more important ailments of animals.

Not so, however, with fistula of the withers. Everyone seems to have his own plan of treatment and few indeed claim even a fair degree of success. Some are satisfied with caustics, others with lancing and irrigations, others with bacterins, while a few of the more daring prefer the radical surgery that removes the causative elements. To these plans might also be added that of those who avoid fistula of the withers entirely, because of the discredit meddlesome intervention generally brings them.

In every rural community of the Middle West the empiric finds a fruitful field for exploitation in the many chronic, loathsome, half-cured fistulae of the withers found in the hands of owners willing to try anything after having given up in despair the various treatments that have failed.

If this book will do no more than to inspire the veterinary practitioner to approach this ailment in a matter of fact manner and to handle it according to the common laws of modern surgical procedure; and if it will discourage a continuance of the other half-hearted and always unsatisfactory methods in vogue, the effort will not have been lost.

CONTENTS.

I. Surgical Anatomy of the Withers.
II. Classification, and Prevalence.
III. Etiology.
IV. Diagnosis.
V. Treatment.
  (a) Treatment with Caustics.
  (b) Lancing and Irrigations.
  (c) Radical Treatment (Including Restraint and Anaesthesia.)
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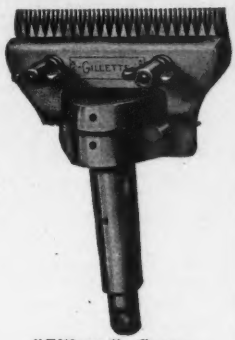

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Dr. D. W. Wright has located for practice at Beaver Dam, Wis.

Dr. J. J. Shoemaker will have charge of the hog farm recently established by the Mid-Continent Hog Company at Topeka, Kans. The concern has made a contract with the city of Topeka to haul away free all garbage for a period of ten years. The company is a $100,000 corporation, of which Dr. O. S. Fowler is president, with headquarters at Denver, Colo., and is going into the hog raising business on a big scale throughout the west. Contracts similar to the one made in Topeka have been made with two Illinois cities, three Iowa cities and two Missouri cities. Each plant will be under the supervision of a veterinarian.

Dr. Ed. Sealstrom has opened an office for practice at Paxton, Ill.

Dr. Howard Beeman, of Chillicothe, Ohio, has erected a modern veterinary hospital in that city. A feature of the building is a maternity ward, where farmers may bring their mares just before they foal and thus ensure proper care and attention being given to the animals.

A farmer near Columbus Junction, Ia., lost seven valuable calves through lead poisoning recently. Tubs that had contained white lead, left in the pen where the calves were kept, became filled with rain water which the animals drank, and death resulted in a few days.

A bill passed in Kansas March 15th provides for the establishment of county hog cholera control organizations, and for the appointment of a county deputy live stock sanitary commissioner to look after the cleaning and disinfection of farms infected with hog cholera and other contagious diseases.

Among recent legislation enacted in Nebraska is a bill raising the state veterinarian's salary from $2,400 to $3,000 a year; also a bill appropriating $50,000 to indemnify owners of live stock killed on account of foot-and-mouth disease. Another bill regulates the manufacture, sale and use of hog cholera serum, re-enacting the main features of the 1915 law which the supreme court found to be unconstitutional. This law forbids the sale of serum by anyone not holding a United States veterinary license and a permit from the state live stock sanitary board. Every dealer must furnish to purchasers and users of serum blanks for reporting results of the treatment. Dealers must report their shipments each month to the board, and the owners of hogs vaccinated are required to report the number of deaths, condition of the animals, etc. The penalty for violation is $100 to $1,000 fine.

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